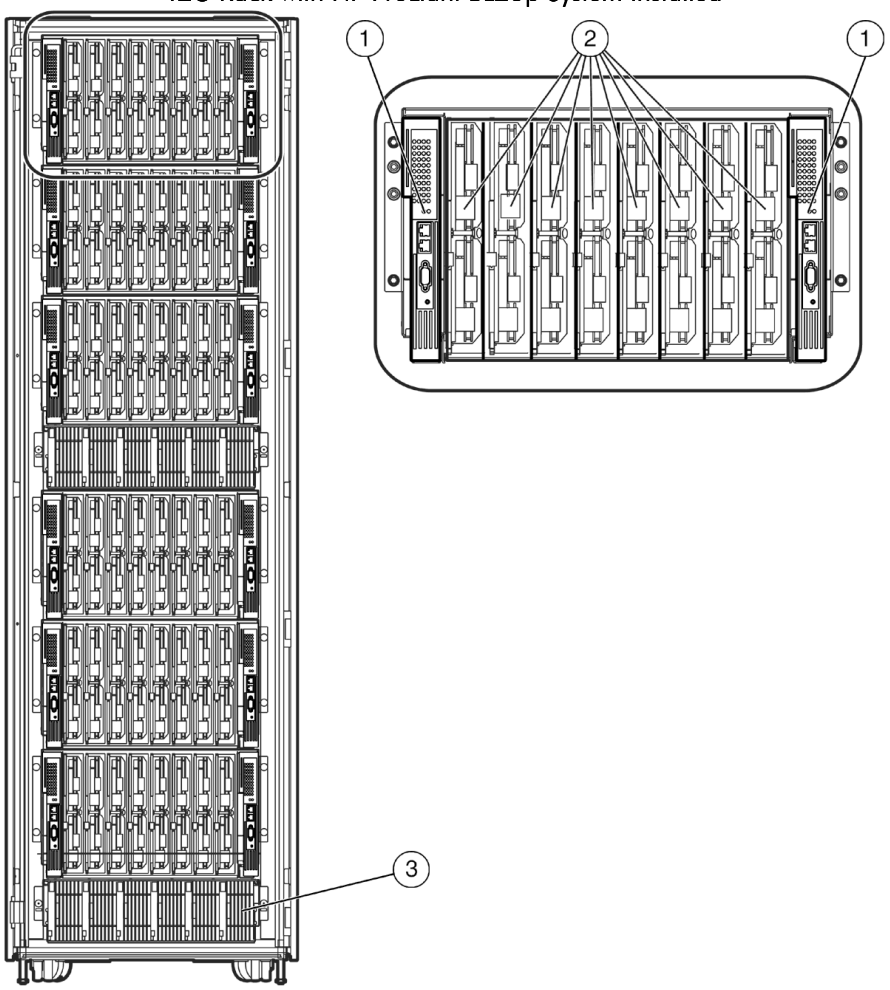
42U Rack with HP ProLiant BL25p System Installed



1. BL p-Class interconnects (2) in HP BladeSystem p-Class server blade enclosure (interconnect switch shown)
2. HP ProLiant BL25p server blades (8) in HP BladeSystem p-Class server blade enclosure
3. HP BladeSystem p-Class 3U power enclosure with hot-plug power supplies (6)

What's New

- Support for AMD Opteron 200 series Dual-Core processors
  - Models 275 (2.2GHz), 270 (2.0GHz) and 265 (1.8GHz)
  - 1MB L2 cache per core
- New HP BladeSystem p-Class 1U Power Enclosure
- Up to two 2.6GHz AMD Opteron Processors with 1M L2 cache
- Up to 16GB ECC PC3200 DDR (8 DIMM slots)
- Integrated Smart Array 6i Plus with optional BBWC

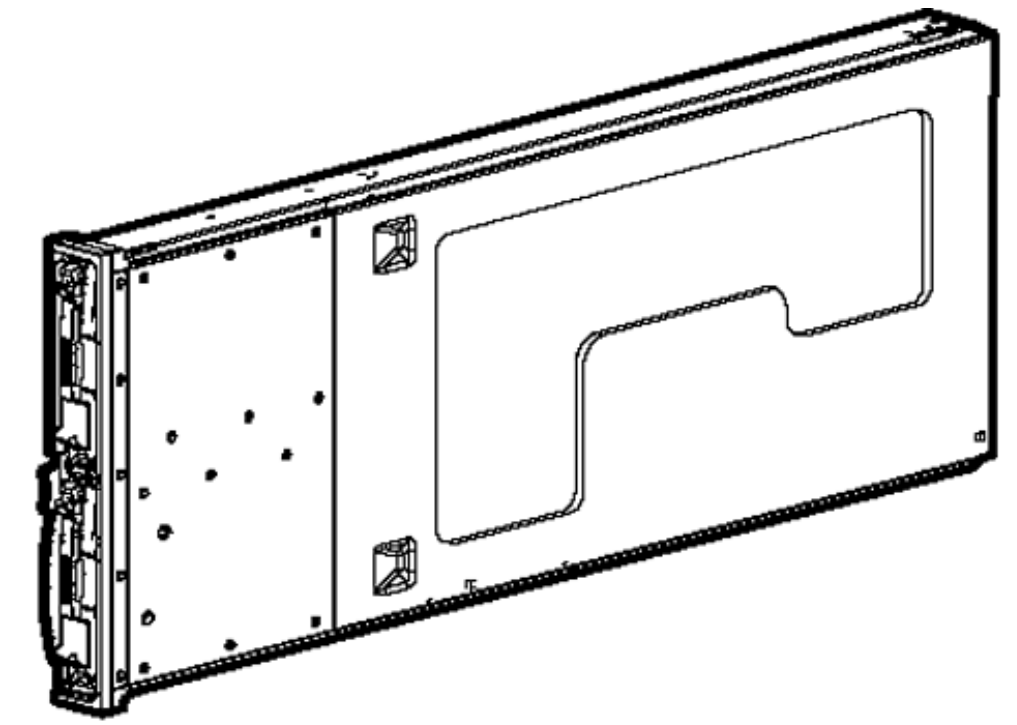
Overview

At A Glance

- Performance dual processor server blade designed with enterprise availability
- HP ProLiant BL25p server blade includes:
- AMD Opteron 200 series single and dual-core processors (dual capability)
  - Models 275 (2.2GHz), 270 (2.0GHz), 265 (1.8GHz), 252 (2.6GHz) and 250 (2.4GHz)
- HP ProLiant BL25p Dual Port Fibre Channel Adapter (2-Gb) option for SAN connectivity
- AMD 8131 and 8111 Chipsets
- 1024-MB or 2048-MB PC3200 Registered ECC 400MHz DDR memory, (2 x 1 Interleaved Memory), expandable to 16 GB
- Five total network adapters:
  - Four PCI-X Gigabit Server NICs (embedded) with WOL and PXE (two single-port NC7781 and one dual-port NC7782)
  - Plus one additional 10/100 NIC dedicated to iLO Management
- Smart Array 6i (integrated on system board Controller with optional battery-backed write cache)
- Wide Ultra320 SCSI Drive Cage standard supports up to two 1" Wide Ultra320 hot plug hard drives
- Integrated Lights-Out (iLO) Advanced Management (ASIC on motherboard)
- Plugs vertically into 6U enclosure, 8 BL25p server blades per enclosure
- Cisco Gigabit Ethernet Switch Module (CGESM) option for Gigabit Ethernet network adapter consolidation.
- Integrated Access Tool for blade management and enhanced server blade documentation including Best Practices and Common Procedures guides
- HP BladeSystem p-Class Server Blade Enclosure:
  - Server blades and interconnects blind mate into server blade enclosures for network connection and power
  - Server blade enclosure is 6U and holds up to 8 HP ProLiant BL25p server blades and 2 interconnects
  - Types of interconnects available: GbE Interconnect Switches, GbE2 and CGESM Interconnect Switches with optional Fibre Channel pass through, Patch Panels or Patch Panel 2 with Fibre Channel pass through
- HP BladeSystem p-Class Power Enclosures:
  - Use BL p-Class sizing tool to determine power based on your configuration http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls.
  - BL p-Class power enclosure provides shared, external, redundant power
  - Choose the HP BladeSystem p-Class 3U power enclosure or the HP BladeSystem p-Class 1U power enclosure
  - Choose single-phase or three-phase power
  - HP BladeSystem power enclosures with power supplies are not needed if using facility -48VDC ± 10%, in this case purchase facility DC option kit
- HP BladeSystem p-Class Power Distribution (only required with the 3U power enclosure):
  - Distributes power from the power enclosure to the server blade enclosures
  - Four power distribution choices:
  - BL p-Class scalable bus bar
  - BL p-Class mini bus bar
  - BL p-Class power bus box
  - Dual power input kit for mini bus bar (required for support of two power enclosures)
- HP ProLiant BL25p server blade, and p-Class server blade enclosure, interconnects and power enclosure protected by a limited three year warranty with optional service uplifts available

  NOTE: Power requirements for a HP BladeSystem p-Class-: 200V - 240V AC, 30 amp or facility DC -48V ± 10%.

Overview



HP ProLiant BL25p Server Blade

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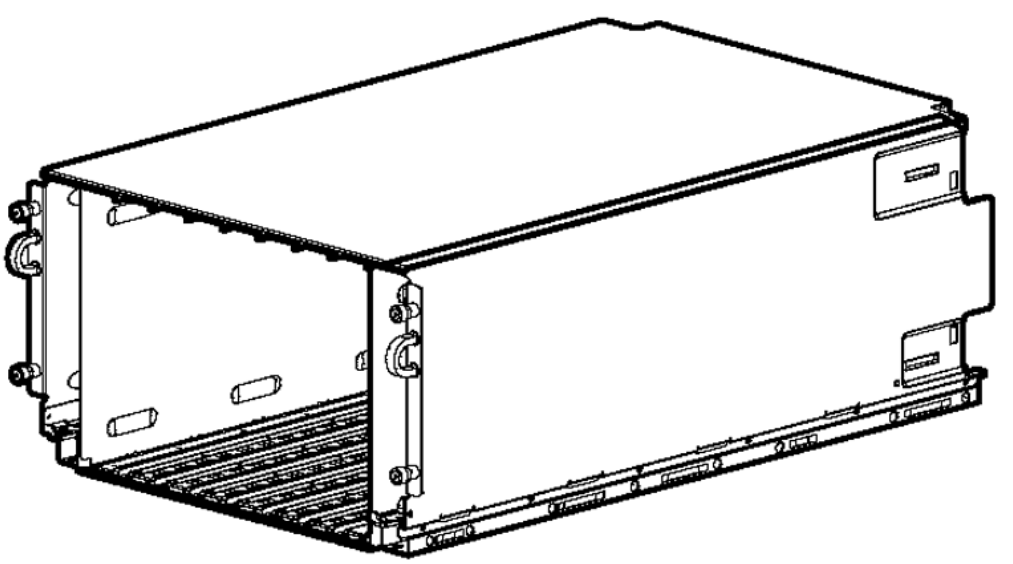

HP BladeSystem p-Class Server Blade Enclosure

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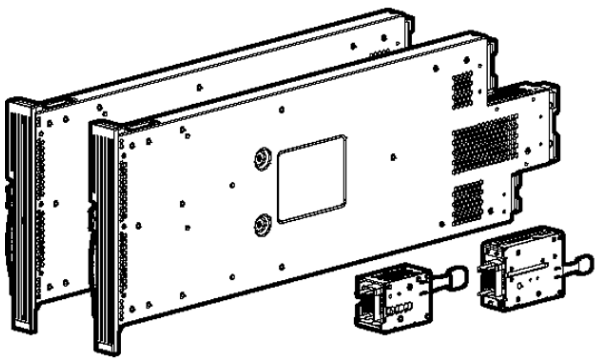
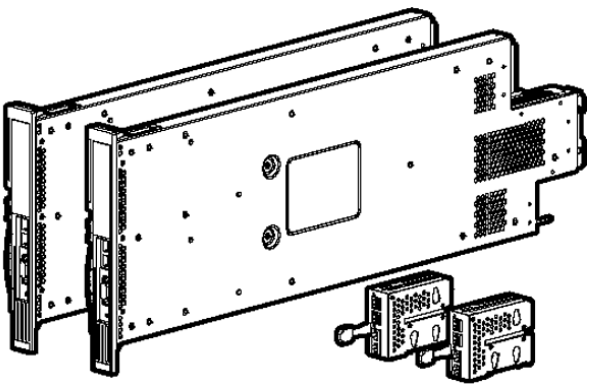
Overview



Patch Panel (shown) or
Patch Panel 2

OR



GbE Interconnect Switch (shown) or GbE2 Interconnect Switch or
CGESM Interconnect Switch (fiber or copper-based)

BL p-Class Interconnects

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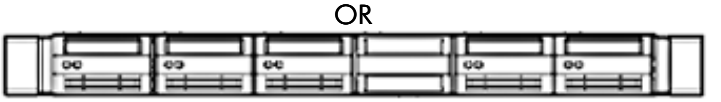
BL p-Class power enclosures and power supplies

OR

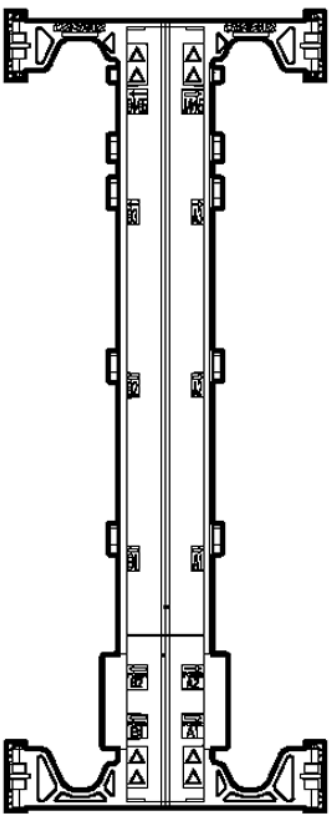


HP BladeSystem p-Class 1U power enclosure and power supplies

OR

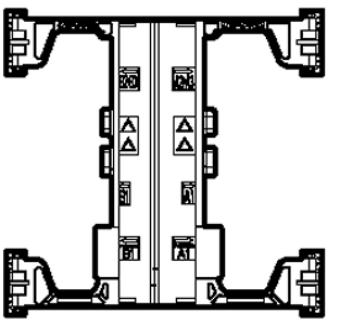
Facility DC

Overview



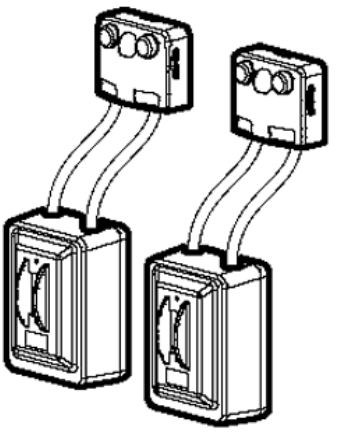
Scalable bus bar

OR

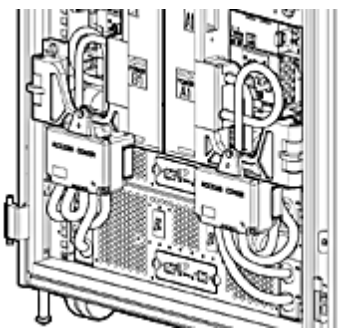


Mini bus bar

OR



Bus boxes



Dual power input kit for mini bus bar

HP BladeSystem p-Class power distribution (only required with the 3U power enclosure)

Configuration Steps

- For a complete configuration of the HP ProLiant BL25p server blade, do the following:

1. Select desired model, configuration and quantity of HP ProLiant BL25p server blades.

   PLUS

2. Decide how many HP BladeSystem p-Class Server Blade Enclosures to purchase (each enclosure can hold up to 8 HP ProLiant BL25p server blades):

   HP BladeSystem p-Class server blade enclosure with enhanced backplane components with 8 Rapid Deployment Pack licenses (281404-B22)
   Or
   HP BladeSystem p-Class server blade enclosure with enhanced backplane components with 8 Rapid Deployment Pack trial (243564-B22)
   Or
   HP BladeSystem p-Class server blade enclosure with enhanced backplane components with 8 HP BladeSystem Management Suite licenses (380625-B22) - includes: a single copy of Systems Insight Manager (SIM) and 8 licenses for each of the following products: Rapid Deployment Pack (RDP), Performance Management Pack (PMP) and the Vulnerability and Patch Management Pack (VPM)
   NOTE: HP BladeSystem p-Class Enhanced Server Blade enclosures may be required depending on which HP ProLiant BL25p server blade model is selected.
   NOTE: The HP BL25p server blade does not currently support PMP. Future support is planned.
   Or

HP BladeSystem p-Class Server Blade Enclosure Upgrade Kit (option)(354100-B21)
NOTE: Server Blade Enclosure Upgrade Kit (354100-B21) contains enhanced backplane components and enables a field upgrade of a blade enclosure to support BL p-class blades and provide a single, physical iLO port for the enclosure.

PLUS

3. Select an Interconnect Kit. Each Interconnect Kit contains a pair of interconnects except the Cisco GESM which contains a single Switch per kit. One pair of interconnects is required with each blade enclosure:
RJ-45 Patch Panel 2 with Fibre Channel pass through (required for Fibre Channel connectivity on HP ProLiant BL20p G3 when using the patch panel interconnect) (306465-B21)
Or
RJ-45 Patch Panel (230766-B21)
Or
Quantity (2) Cisco Gigabit Switch Module for HP BladeSystem p-Class Interconnect Kit (with 16 10/100/1000 T/TX/T downlink ports, 2 RJ-45 10/100/1000 T/TX/T uplink ports, and 4 SFP ports) (378926-B21), with or without any combination of up to 4 10/100/1000 T/TX/T RJ-45 SFP Module (378928-B21) or 1000BASE SX Fiber SFP Module (378929-B21), with or without ProLiant BL p-Class Storage Connectivity Kit (with 16 Fibre Channel connectors) (321745 -B21) (required for ProLiant BLXXp server blade Fibre Channel connectivity when using the CGESM Interconnect Switch)
Or
Quantity (2) Cisco Gigabit Switch Module for HP BladeSystem p-Class Interconnect Kit (with 16 10/100/1000 T/TX/T downlink ports, 2 RJ-45 10/100/1000 T/TX/T uplink ports, and 4 SFP ports populated with 2 10/100/1000 T/TX/T SFP modules) (378927-B21), with or without optional ProLiant BL p-Class Storage Connectivity Kit (with 16 Fibre Channel connectors) (321745 -B21) (required for ProLiant BLXXp server blade Fibre Channel connectivity when using the CGESM Interconnect Switch)
Or
BL p-Class C-GbE2 Interconnect Kit (with 16 10/100/1000 T/TX/T downlink ports, 6 RJ-45 10/100/1000 T/TX/T uplink ports) (283192-B21), with or without optional ProLiant BL p-Class Storage Connectivity Kit (with 16 Fibre Channel connectors) (321745 -B21) (required for ProLiant BLXXp server blade Fibre Channel connectivity when using the GbE2 Interconnect Switch)
Or
BL p-Class F-GbE2 Interconnect (with 16 10/100/1000 T/TX/T downlink ports, 4 LC 1000 SX and 2 RJ-45 10/100/1000 T/TX/T uplink ports) (283193-B21), with or without optional ProLiant BL p-Class Storage Connectivity Kit (with 16 Fibre Channel connectors) (321745 -B21) (required for BLXXp server blade Fibre Channel connectivity when using the GbE2 Interconnect Switch)
Or
BL p-Class C-GbE Interconnect Kit (with 4 RJ-45 10/100/1000 T/TX/T uplink ports and 16 RJ-45 10/100 T/TX downlink ports (249655-B21)
Or
BL p-Class F-GbE Interconnect Kit (with 4 LC 1000 SX uplink ports and 16 RJ-45 10/100 T/TX downlink ports) (279720-B21)

PLUS

4. Select a HP BladeSystem p-Class power enclosure and power supplies based on configuration. Use p-Class sizing tool to help determine power configuration: http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls.
NOTE: Power enclosures and supplies are not needed if using facility DC (-48V ± 10%).
Single phase 3U power enclosure with four power supplies (Single-phase 3U power enclosure holds a max of four power supplies) (NA/JPN- 239162-001) (INTL - 239162-421)
Or
Three-phase 3U power enclosure with six power supplies (Three-phase 3U power enclosure holds a max of six power supplies) (NA/JPN- 230769-001) (INTL - 230769-421)
NOTE: 3U Power enclosures and supplies can also be purchased separately see options list
Or
1U power enclosure with six power supplies (378284-B21)
Or

1U power enclosure with two power supplies (380314-B21)
NOTE: Additional power supplies can also be purchased separately - see options list below.

PLUS

5. Select power distribution (only required with 3U power enclosures):
Scalable bus bar - Supports up to 5 server blade enclosures* (240560-B21)
Or
Mini bus bar - Supports up to 3 server blade enclosures* (240559-B21)
Or
Power Bus Box - Supports only 1 server blade enclosure* (240562-B21)
Dual Power Input Kit for Mini Bus Bar - required for support of two power enclosures. (364565-B21)
Or
HP Modular Distribution Unit 40 Amp (NA/JPN) (P/N 252663-D75)**
Or
HP Modular Distribution Unit 40 Amp (Int'l) (P/N 252663-B34)**
Or
HP Modular Distribution Unit 32 Amp (Int'l) (P/N 252663-B33)**
Or
HP Modular Distribution Unit 24 Amp (NA/JPN) (P/N 252663-D74)**
*NOTE: Maximum depends upon power input
**NOTE: The Modular Distribution Unit Kits excludes the extension bars as they are not required with the HP BladeSystem p-class 1U power enclosure.

Standard Features (Server Blade)

Processors	AMD Opteron Model 252 processor 2.6 GHz/1 GHz - 1MB (single-core) AMD Opteron Model 250 processor 2.4 GHz/800 MHz - 1MB (single-core) AMD Opteron Model 265 processor 1.8GHz/1 GHz (dual-core) AMD Opteron Model 270 processor 2.0GHz/1 GHz (dual-core) AMD Opteron Model 275 processor 2.2GHz/1 GHz (dual-core)	
Upgradeability	Upgradeable to dual processing.	
Cache Memory	1-MB Level 2 Cache per core	
Chipset	AMD 8131 and 8111 chipsets	
Memory	Standard	1024 MB or 2048 MB of 2-way interleaved PC3200 DDR SDRAM running at 400MHz (depending on model)
	Maximum	16 GB
	NOTE: Memory must be installed in pairs.	
Network Adapter	Five network adapters total: Four PCI-X Gigabit NICs (embedded) with WOL and PXE (two single-port NC7781 and one dual-port NC7782) One 10/100 iLO NIC dedicated to management NOTE: Must use a HP BladeSystem p-class server blade enclosure with enhanced backplane to utilize all four NIC's (281404-B22, 243564-B22 or 380625-B22).	
Manageability	Integrated Lights-Out (iLO) Management Advanced (ASIC on the System Board)	
Internal Storage	Hard Drives	None ship standard
	Maximum Internal Storage	600 GB (internal drive cage) (2 x 300 GB Wide Ultra320, 1" drive

Standard Features (Server Blade)

Fiber Channel on the HP ProLiant BL25p server blade

The following items are needed to connect the HP ProLiant BL25p server blade to the SAN:

1. HP ProLiant BL25/45p Dual-port Fibre Channel Adapter plugs into the Server Blades

- The HP ProLiant BL25/45p dual-port Fibre Channel Adapter is compatible with the new HP ProLiant BL25p and BL45p server blades (it cannot be used with a HP ProLiant BL20p, HP ProLiant BL30p, HP ProLiant BL35p or HP ProLiant BL40p server blades)
- Two ports on each Dual-port Fibre Channel Mezzanine Card provide a redundant Fibre Channel connection to each server blade
- Supports up to 2 Gb/s Fibre Channel equipment
- Uses the QLogic chipset
- Includes two small form factor pluggable transceivers with LC connectors for installation into the Patch Panel 2, CGESM or GbE2 Interconnect Switch (with the Storage Connectivity Kit)
- The HP ProLiant BL25p Dual-port Fibre Channel Adapter Option Kit must be ordered separately. and

2A. BL p-Class Patch Panel 2 (with Fibre Channel pass through) interconnect option

- Allows pass through of both Ethernet and Fibre Channel signals
- Ethernet signals exit out the rear of the RJ-45 Patch Panel G2; Fibre Channel signals exit out the front of the RJ-45 Patch Panel G2
  8 Fibre Channel small form factor pluggable (SPF) transceiver slots on the front of each RJ-45 patch panel 2 (16 Fibre Channel connections per server blade enclosure); for insertion of SPF transceivers included with the HP ProLiant BL25p Dual-port Fibre Channel kit
  or

2B. BL p-Class C-GbE2 or F-GbE2 or CGESM Interconnect Kit plus the optional Storage Connectivity Kit

- Allows LAN signal consolidation and pass through of BL20p G3 Fibre Channel signals
- Both LAN Ethernet signals and SAN Fibre Channel signals exit out the rear of the GbE2 or CGESM Interconnect Switch (with the Storage Connectivity Kit option) via dedicated modular interconnect modules
- 8 Fibre Channel small form factor pluggable (SPF) transceiver slots on the back of each GbE2 Interconnect Switch (16 Fibre Channel SPF slots per server blade enclosure)
- SPF transceivers are included with the HP ProLiant BL25p Dual-port Fibre Channel Adapter kit and

3. Compatible SAN

- Optimized for StorageWorks arrays: HSG80 (MA8000, EMA12000, EMA16000); EVA5000; EVA3000; XP48, XP128, XP512, XP1024; HP StorageWorks Modular Smart Array 1000 and 1500
- Compatible with select 3rd party SANs (please see blade storage page for more details http://h18000.www1.hp.com/products/servers/proliant-bl/p-class/storage.html)

Expansion Slots

No PCI slots all features are integrated

I/O cable connectors:

(2)USB ports, (1) video port, (1) iLO port and (1) kernel debug port

(2) I/O cables ship with every server blade enclosure

Tested USB devices (keyboard, mouse, floppy) are listed in the "Options" section of this QuickSpecs

HP BladeSystem p-Class Server Blade Enclosures and ProLiant BL p-Class Interconnects

HP BladeSystem p-Class Server Blade Enclosures

6U (10.5-inch), 19-inch wide

Holds up to 8 HP ProLiant BL25p servers blades

10 bays per server blade enclosure 8 bays for server blades

2 outside bays for interconnect modules (RJ-45 Patch Panel, RJ-45 Patch Panel 2, GbE Interconnect Switch, GbE2 Interconnect Switch or CGESM Interconnect Switch)

Server blades blind mate into the server blade enclosure backplane for power and data connections

NOTE: HP BladeSystem p-Class Enhanced Server Blade enclosures might be required depending on which HP ProLiant BL25p server blade model is selected.
http://www.hp.com/go/bladesystem/enclosure/compatibility

NOTE: Server Blade Enclosure Upgrade Kit (354100-B21) contains enhanced backplane components and enables a field upgrade of a blade enclosure to support specific HP ProLiant BL25p server blade models and provide a single, physical iLO port for the enclosure.

Server blade management module attached to the back of each HP BladeSystem p-Class 6U server blade enclosure to report events all servers and provide asset and inventory information

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HP BladeSystem p-Class Power Requirements

Redundant 200V - 240V AC, 30 amp single-phase for NA and International
Redundant 208V 30amp 3-phase 4 wire, NA
Redundant 380 - 415V 20A 3-phase 5 wire, Intl
Redundant -48VDC ± 10%

ProLiant BL p-Class Interconnect Switch Option

(Every HP BladeSystem p-Class server blade enclosure requires two interconnect switches OR two RJ-45 patch panels)

Provides up to a 32 to 1 server networking cable reduction per server enclosure depending on the mix of HP ProLiant BL20p, HP ProLiant BL25p, HP ProLiant BL30p, HP ProLiant BL35p, HP ProLiant BL40p and HP ProLiant BL45p server blades. Each interconnect switch (two per enclosure) reduces up to sixteen internal server network (NIC) ports to six external ports (four on a modular rear mounting interconnect module and two on the switch front panel). This provides a total of twelve external ports per server blade enclosure. Only one to all twelve external ports may be used per server blade enclosure.

The Cisco Gigabit Ethernet Switch Module (CGESM) Interconnect Kits are for applications that require network adapter consolidation to 1000 Mbps (Gigabit Ethernet) in a Cisco infrastructure. The CGESM supports the same and HP ProLiant BL25p Fibre Channel pass-through as the GbE2.

- The Cisco Gigabit Ethernet Switch Module Interconnect kit includes one CGESM Interconnect Switch or one CGESM with four (4) RJ-45 10/100/1000 T/TX/T Small Form Factor Pluggable (SFP) Modules
- Quantity 2 Cisco Gigabit Ethernet Switch Module Interconnect kits provide two CGESM Interconnect Switches providing any combination of up to twelve (12) RJ-45 10/100/1000 T/TX/T or Fiber SX external ports per server blade enclosure.
- The optional ProLiant BL p-Class Storage Connectivity Kit (321745 -B21) is required for HP ProLiant BL25p Fibre Channel pass-through when using either the CGESM Interconnect Kit.

Standard Features (Server Blade Enclosure and Interconnects)

The GbE2 Interconnect Kits (C-GbE2 and F-GbE2) are for applications that require network adapter consolidation to 1000 Mbps (Gigabit Ethernet) and HP ProLiant BL25p Fibre Channel pass-through.

- The ProLiant BL p-Class F-GbE2 Interconnect Kit includes two GbE2 Interconnect Switches and two QuadSX Interconnect Modules that provide eight (8) LC 1000 SX and four (4) RJ-45 10/100/1000 T/TX/T external ports per server blade enclosure.
- The ProLiant BL p-Class C-GbE2 Interconnect Kit includes two GbE2 Interconnect Switches and two QuadT2 Interconnect Modules that provide twelve (12) RJ-45 10/100/1000 T/TX/T external ports per server blade enclosure.

The optional ProLiant BL p-Class Storage Connectivity Kit (321745 -B21) is required for HP ProLiant BL25p Fibre Channel pass-through when using either the C-GbE2 or F-GbE2 Interconnect Kit.

The GbE Interconnect Kits (C-GbE and F-GbE) are for applications that require network adapter consolidation to 100 Mbps (Fast Ethernet).

- The ProLiant BL p-Class F-GbE Interconnect Kit includes two GbE Interconnect Switches and two DualTSX Interconnect Modules that provide four (4) LC 1000 SX and eight (8) RJ-45 10/100 T/TX external ports per server blade enclosure.
- The ProLiant BL p-Class C-GbE Interconnect Kit includes two GbE Interconnect Switches and two QuadT Interconnect Modules that provide four (4) RJ-45 10/100/1000 T/TX/T and eight (8) RJ-45 10/100 T/TX external ports per server blade enclosure.

Also included (per Interconnect Switch):

- One (1) RS-232 DB-9 front panel out-of-band management port
- Redundant crosslink ports connecting the two interconnect switches
- Redundant power inputs and on-board redundant fans
- Hot-plug and hot- remove with configuration retention and no need to cable/re-cable
- Power ON, management, and per port status and speed LED indicators
- Reset/power momentary push-button switch
- HP ProLiant BL Interconnect Switch Management Utilities and User Documentation CD
- Fully pre-configured for rapid deployment and immediate operation

The GbE Interconnect Kits (C-GbE and F-GbE) are for applications that require network adapter consolidation to 100 Mbps (Fast Ethernet).

- The ProLiant BL p-Class F-GbE Interconnect Kit includes two GbE Interconnect Switches and two DualTSX Interconnect Modules that provide four (4) LC 1000 SX and eight (8) RJ-45 10/100 T/TX external ports per server blade enclosure.
- The ProLiant BL p-Class C-GbE Interconnect Kit includes two GbE Interconnect Switches and two QuadT Interconnect Modules that provide four (4) RJ-45 10/100/1000 T/TX/T and eight (8) RJ-45 10/100 T/TX external ports per server blade enclosure.

ProLiant BL Interconnect Switch Management System and Utilities:

Full featured web-based and scriptable command line (CLI) interfaces, password protected multi-level user accounts, Telnet, SNMP, BootP client, port mirroring, port-based VLANs and VLAN tagging, EtherChannel compatible multi-port trunking, network time protocol, spanning tree protocol, broadcast/multicast storm control, flow control, human readable/writeable configuration file, TFTP client, IP address security restrictions, auto-MDI/MDIX, auto-negotiation and auto-sensing of speed and duplex mode, and more.

Standard Features (Server Blade Enclosure and Interconnects)

ProLiant BL p-Class Storage Connectivity Kit Option (Supports two CGESM or GbE2 switches per kit)

The Storage Connectivity Kit is used if HP ProLiant BL25p Fibre Channel signal pass-through is desired when using the CGESM or GbE2 Interconnect Switch. Therefore, both LAN cable consolidation and SAN connectivity is possible using a single interconnect option. Order one Storage Connectivity Kit per server blade enclosure for Fibre Channel pass through.
The Storage Connectivity Kit includes two OctalFC Interconnect Modules that provide sixteen open transceiver slots for the pluggable small form factor transceivers that come with each HP ProLiant BL25/45p Dual port Fibre Channel Adapter. The Storage Connectivity Kit supports up to eight HP ProLiant BL25p server blades (for a total of sixteen Fibre Channel signals).

ProLiant BL p-Class RJ-45 Patch Panel (Two patch panels per kit) (Every BL p-Class server blade enclosure requires two Interconnect switches OR two RJ-45 patch panels)

6U (10.5-inch), Plugs into HP BladeSystem p-Class 6U server blade enclosures

Used to pass NIC signals from all server blades in server blade enclosure out as RJ-45 connections

Supports Gigabit Ethernet network adapters

16 RJ-45 connectors on the back of each BL p-Class 6U RJ-45 Patch Panel (32 RJ-45 connections per server blade enclosure)

ProLiant BL p-Class RJ-45 Patch Panel 2 (with Fibre Channel pass through) (Two patch panels per kit) (Every BL p-Class server blade enclosure requires two Interconnect switches OR two RJ-45 patch panels)
NOTE: The Patch Panel 2 or a Switch Interconnect Kit is required for SAN connectivity on the HP ProLiant BL25p server blade

6U (10.5-inch), Plugs into HP BladeSystem p-Class 6U server blade enclosures

Used to pass NIC signals from all server blades in server blade enclosure out as RJ-45 connections also used to pass Fibre Channel signals for SAN connectivity

Supports Gigabit Ethernet network adapters

16 RJ-45 connectors on the back of each RJ-45 patch panel 2 (32 RJ-45 connections per server blade enclosure)

Fibre Channel, pass through

Fibre Channel signals travel from a HP ProLiant BL25p server blade with a Dual-Port Fibre Channel Adapter through p-Class server blade enclosure backplane. The Fibre Channel signals are terminated through the RJ-45 Patch Panel 2 in the interconnect bays. To provide redundancy each server blade has two Fibre Channel signals and one Fibre Channel signal terminates through the right RJ-45 Patch Panel 2, one Fibre Channel signal travels terminates through the left RJ-45 Patch Panel 2.

8 Fibre Channel small form factor pluggable (SPF) transceiver slots on the front of each RJ-45 patch panel 2 (16 Fibre Channel connections per server blade enclosure); for insertion of SPF transceivers included with the Dual-port Fibre Channel Adapter

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Required Network Cabling

10Base-T	Categories 3, 4 or 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
100Base-TX	Category 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
1000Base-T	Category 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
1000Base-SX	50/125 μm Multimode Fiber, 400 MHz/Km (500 meters) 50/125 μm Multimode Fiber, 500 MHz/Km (550 meters) 62.5/125 μm Multimode Fiber, 160 MHz/Km (220 meters) 62.5/125 μm Multimode Fiber, 200 MHz/Km (275 meters)

NOTE: For cabling information, refer to the Web site at: http://www.compaq.com/products/servers.

Standard Features (Power System and Rack Information)

HP BladeSystem p-Class Power System and Rack Information	NOTE: To determine power configuration please refer to the HP BladeSystem p-Class Overview and Planning Whitepaper and sizing tool at http://h18000.www1.hp.com/products/servers/proliant-bl/p-class/20p/index.html.
HP BladeSystem p-Class 3U Power Enclosure	3U (5.25-inch), 19-inch wide, 29-inch deep (0.48-meter wide, 0.74-meter deep), Dual input single phase and three phase models available. HP BladeSystem p-Class 3U power enclosure provides external, shared hot-plug power. Each three-phase power enclosure houses up to six hot-plug power supplies each single-phase power enclosures hold up to four hot-plug power supplies to power the BL p-Class server blades and interconnects Please use the sizing utility to determine the power needed for each configuration http://www.hp.com/go/bladesystem/powercalculator. Power enclosures and power supplies are not needed if using facility DC (-48V DC ± 10%). If using facility DC, only Facility DC Power Connection kit part number (240563-B21) is needed.
HP BladeSystem p-Class 1U Power Enclosure	1U (1.75-inch), 19-inch wide, 29-inch deep (0.48-meter wide, 0.74-meter deep), Multi-input single phase or three phase operation. HP BladeSystem p-Class 1U power enclosure provides external, hot-plug power. Each 1U power enclosure houses up to six hot-plug power supplies to power up to one server blade enclosure, fully populated with BL p-Class server blades and interconnects. Please use the sizing utility to determine the power needed for each configuration http://www.hp.com/go/bladesystem/powercalculator. NOTE: Power enclosures and power supplies are not needed if using facility DC (-48V DC ± 10%). If using facility DC, only Facility DC Power Connection kit part number (240563-B21) is needed.
HP BladeSystem p-Class Power Distribution (only required with 3U power enclosures)	In the HP BladeSystem p-Class infrastructure, redundant -48 VDC power (from the power enclosures or facility DC power) is distributed from the power enclosures to the server blade enclosures through the bus bar system. Hinges attach the HP BladeSystem bus bars to the rails in a rack. The bus bars swing open from the center to enable easy rear access to the server blades and network cables. Power is distributed redundantly through independent A- and B-sided bus bars. Three different power distribution solutions are available depending on the maximum number of server blade enclosures planned for the rack: • HP BladeSystem p-Class scalable bus bar • HP BladeSystem p-Class mini bus bar • HP BladeSystem p-Class power bus box NOTE: To support a full 42U rack of HP ProLiant BL25p server blades (6 server blade enclosures), two mini bus bars are needed.

Standard Features (Power System and Rack Information)

	Power Enclosures Supported	Server Blade Enclosures Supported	Max. Rack Space Occupied
Scalable Bus Bar	1 or 2	up to 5	36U
Mini Bus Bar	1 or 2	up to 3	21U
Power Bus Box	1 Dual power input kit for mini bus bar option (364565-B21) required to support two power enclosures. NOTE: To support a full 42U rack of BL p-Class server blades, use two stacked pairs of mini bus bars.	1	9U

Required Power Source	Two 30amp redundant power feeds per power enclosure Connectors -NEMA receptacles (NA/Japan) NA 1-phase L6-30, 250v, 30A 3-wire NA 3-phase L15-30, 250V, 30A, 4-wire -IEC 309 Pin & Sleeve connectors (International) Intl 1-phase 250V, 32A, 3- pin (2 pole + ground) Intl 3-phase 380-415V, 32A, 5--pin (4 pole + ground) Optimized for power cabling from bottom and network cabling from top

Standard Features

ProLiant Essentials Foundation Pack Software for the ProLiant BL Server Blades	ProLiant Essentials Rapid Deployment Pack	Rapid Deployment Pack (RDP) is an automated deployment and provisioning solution for all ProLiant servers. RDP includes the Altiris Deployment Solution and ProLiant Integration Module featuring ProLiant server pre-configured events for OS installation, and optimized software drivers, firmware and management agents. Every RDP CD includes 10-node trial licenses for evaluation purposes. RDP requires a license for each server deployed and is available for purchase with blade servers. For more information, visit http://www.hp.com/servers/rdp.
	HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) help maximize system uptime and performance and reduce system maintenance costs by providing proactive notification of problems before those problems result in unplanned downtime or reduced productivity. HP SIM is easy to set up to work with the Insight Management Agents, integrated Light-Out and Remote Insight Light-Out Edition, and Version Control Agents to deliver robust fault, configuration, and asset management as well as remote administration. With HP Systems Insight Manager customers will also be able to take advantage of role-based security; the ability to manage ProLiant, Integrity, and HP9000 systems; and plug-ins for storage, client, printer, and power management as well as server rapid deployment, performance management, and workload management. For more details on HP Systems Insight Manager visit http://www.hp.com/go/hpsim.
	Management Agents	The Management Agents form the foundation for HP's Intelligent Manageability strategy. They provide direct, browser-based access to in-depth instrumentation built into HP servers, workstations, desktops, and portables, and send alerts to HP Systems Insight Manager and other enterprise management applications in case of subsystem or environmental failures. For additional information about the Management Agents and other management products from HP, please visit the management Web site at http://www.hp.com/servers/manage.
	Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
	ROMPaq, support software, and configuration utilities	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available in the RDP CD, SmartStart or downloadable from Software and Drivers download pages, linked from the SmartStart website at http://www.hp.com/go/support.
	Insight Diagnostics Online Edition	The most advanced configuration analysis, reporting and troubleshooting utilities used by HP and at your fingertips, available in SmartStart.

NOTE: For more information regarding ProLiant Essentials Software, please see the following URL: http://www.hp.com/servers/proliantessentials

Standard Features

Optional ProLiant Essentials Value Packs

Optional software offerings that selectively extend the functionality of an Adaptive Infrastructure to address specific business problems and needs:

- Workload Management Pack - provides easier management of complex environments, improving overall server utilization and enabling Windows® 2000 customers for the first time to confidently deploy multiple applications on a single multiprocessor ProLiant Server.
- Performance Management Pack - a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources.
- Intelligent Networking Pack - detects and analyzes network bottlenecks or broken network linkages and steers traffic to the optimum route based on network conditions.
- Vulnerability and Patch management Pack - identifies and remediates software security vulnerabilities due to missing patches as well operating system configurations that can be exploited by viruses, worms and other blended threats.
- Virtual Machine Management Pack - provides central management and control of virtual machines from Microsoft and VMware. Integrated approach provides the ability to manage both physical and virtual resources from a single management console.

NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information.

SmartStart

SmartStart is a tool that simplifies single server setup, providing a rapid way to deploy reliable and consistent server configurations. SmartStart 7.30 and later can now deploy all HP ProLiant BL25p server blades, using the I/O port with an attached USB CD-ROM device. To obtain a copy of SmartStart for your blade server, redeem the coupon that is included with your Blade server or order your copy from the SmartStart web site. For more information, please visit the SmartStart Web site at http://www.hp.com/servers/smartstart.
SmartStart version supported (minimum): SmartStart 6.20

OS Support: Single-Core

2.4 GHz and 2.6 GHz models

Microsoft Windows 2000 Server
Microsoft Windows 2000 Advanced Server
Windows Server 2003, Standard Edition
Windows Server 2003, Enterprise Edition
Red Hat Enterprise Linux 3
Red Hat Enterprise Linux 4
SuSE Linux Enterprise Server 8
SuSE Linux Enterprise Server 9
NOTE: For a complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: http://www.hp.com/go/supportos.
NOTE: For an up-to-date listing of the latest drivers available for the HP ProLiant BL p-Class, please see: http://h18004.www1.hp.com/support/files/server/us/family/model/5342.html.
NOTE: For a more complete and up-to-date information on Linux support, please visit HP Linux Web site at: http://h18000.www1.hp.com/products/servers/linux/hpLinuxcert.html.

Standard Features

OS Support: Dual-Core 1.8 GHz, 2.0 GHz and 2.2 GHz models	Microsoft Windows 2000 Server (licensed by core) Microsoft Windows 2000 Advanced Server (licensed by core) Windows Server 2003, Standard Edition (licensed by processor socket) Windows Server 2003, Enterprise Edition (licensed by processor socket) Red Hat Enterprise Linux 3 Update 5 Red Hat Enterprise Linux 4 Update 2 SuSE Linux Enterprise Server 9 SP1 NOTE: For a complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: http://www.hp.com/go/supportos. NOTE: For an up-to-date listing of the latest drivers available for the HP ProLiant BL p-Class, please see: http://h18004.www1.hp.com/support/files/server/us/family/model/5342.html. NOTE: For a more complete and up-to-date information on Linux support, please visit HP Linux Web site at: http://h18000.www1.hp.com/products/servers/linux/hpLinuxcert.html.

Intelligent Manageability	Integrated Lights-Out Advanced (iLO) Virtual Text and Graphical Remote Console * Virtual CD-ROM* Virtual Floppy * Virtual Power Button Control Dedicated LAN Connectivity Automatic IP Configuration via DHCP/DNS/WINS Industry Standard 128-bit Secure Sockets Layer (SSL) Security IML and iLO Event Logging Support for 12 user accounts with customizable access privileges Automatic Server Recovery-2 (ASR-2) Insight Manager 7 HP Systems Insight Manager Redundant ROM Remote Flash ROM ROM Based Setup Utility (RBSU) Advanced Configuration and Power Interface Specification Ready (ACPI) Server and Interconnect Switch Health Logs Redundant Power Supply Utility Pre-Failure Warranty (covers processors, as well as hard drives and memory) Interconnect Switch Management System and Utilities (Interconnect Switch option) Integrated Management Log (IML) Off-Line Backup Processor capability Dynamic sector repairing and drive parameter tracking (with Smart Array controllers) Network adapter teaming set-up utility * Advanced features such as Graphical Remote Console and Virtual Floppy are included with the BL p-Class server.

Standard Features

Availability

Power redundancy: Redundant AC feeds into power enclosures, redundant DC feeds from power enclosure to server blade enclosures,
N + N redundant power supplies
Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection
Two hot-plug SCSI hard drive bays and integrated RAID (Smart Array 6i Plus) on every server blade (Battery-backed write cache is optional.)
Redundant ROM on each server blade
ECC Memory
Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)
Interconnects Switch Availability

- Hot-plug and hot- remove with configuration retention and no need to cable/re-cable
- Two network connections per server blade bay (four NICs total) routed to two redundant interconnect switches
- Redundant Ethernet inter-switch communication with two sets of redundant Ethernet uplink ports per each interconnect switch
- Redundant front panel ports per each interconnect switch for diagnostics, management, and additional uplinks
- Redundant serial ports
- Compatibility with PVST+ (CGESM or GbE2 switch) and 802.1D Spanning tree protocol support for loop-free path redundancy
- Static IEEE 802.3ad (EtherChannel compatible) trunking with automatic port load balancing and failover
- Redundant configuration files and operating system firmware images in memory (GbE2 switch)
- Redundant fans per each interconnect switch
- Redundant 1+1 power to each interconnect switch
- Support for ProLiant network adapter teaming
- Redundant configurable community strings and SNMP trap manager hosts
- Redundant configurable syslog server, DNS server, and default gateways (GbE2 switch)

Security

Power-on password
Administrator's password
Integrated Lights-Out has 12 customizable user accounts and SSL encryption
Integrated Lights-Out can be disabled via a Global Setting
Interconnect switch multilevel user names and passwords, management interface time out period setting, SSH*, SCP secure copy protocol*, port-based IEEE 802.1Q tagged VLANs, RADIUS user authentication and authorization*, and IP address restriction
* CGESM and GbE2 Interconnect Switch only

Standard Features

Minimum Rack Requirements

Mounts in ProLiant, and Telco racks and Third Party racks that meet the following criteria:

- Compatible with 19-inch Standard EIA rail sets
- EIA rail-to-rail depth is 29 - 30"
- Cabinet depth must be at least 36-inch deep overall (Additional min. 3.5-inch clearance from rear RETMA rail to rear door, inclusive in the 36-inch overall depth)
- Ample room for top and bottom cable egress (approximately 8 square inches for full rack configuration with patch panel)
- Must be capable of supporting 1600 lb (for full rack configuration)
- Perforated front and rear doors to accommodate front-to-back cooling
- Must have 65% open perforation on server blade enclosure doors to support airflow requirements
- Optimized for use with the HP 10000 Series racks

NOTE: If using Compaq 7000 Series rack, Rack Extension Kit and High Air Flow Rack Door options are required.

Rack Airflow Requirements

Rack 10000 series Cabinets

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
- Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL: http://www.hp.com/servers/bl25p.

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging and custom packaging. HP products supported through Factory Express include: a wide array of servers and storage: HP Integrity, HP ProLiant & HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSA1000, VA7xxx, EVA3000 & EVA5000, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to http://www.hp.com/go/factory-express.

Standard Features

Service and Support

Three-year limited warranty, including hardware diagnostic support, pre-failure warranty (coverage of hard drives, memory and processors). The warranty is fully supported by HP Services and a worldwide network of resellers and service providers. In addition 90-day's getting started software telephone support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services.
NOTE: Sever Blade Limited Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.
NOTE: Server Blade Enclosure and Interconnects Limited Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.

Care Pack services provide a range of life cycle support options that let you choose the service levels that meet your business requirements, from basic to mission-critical.

A full range of HP Care Pack hardware and software services are available including:

- Installation and start up
- Education courses
- Extended onsite hardware coverage hours from same business day 13 hours, 5 day to 24 hours, 7 days call window with options including 4-hour response or 6-hour Call To Repair
- Comprehensive range of software technical support for Microsoft, Linux, ProLiant Essentials and VMWare-based IT solutions helping to deliver high level of application availability. Response times range from 30 mins for critical problems to 2 hours.
- System Management, Performance Services and Mission Critical Support Solution

HP Care Pack services for ProLiant BL p-Class server blades, cover the server blade and the HP BladeSystem p-Class blade enclosure that the server blade is installed in as well as interconnects, power enclosure with power supplies and power distribution.
NOTE: For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: http://www.hp.com/hps/carepack
NOTE: For more complete information on HP Services offerings, customers and resellers, please visit us at: http://www.hp.com/hps
NOTE: Additional information regarding worldwide limited warranty and technical support is available at:
http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

Models

ProLiant BL25p 1.8GHz-1MB,DC 1GB (1P) 392443-B21	Processor(s)	(1) AMD Opteron Model 265 dual-core 1.8 GHz standard (up to 2 supported)
	Cache Memory	1-MB Level 2 cache per core
	Memory	1024-MB (Standard) to 16-GB (Maximum) of 2-way interleaved capable PC3200 DDR SDRAM running at 400MHz (2x512 MB)
	Network Adapter	Four Gigabit NICs (embedded) with WOL and PXE One additional 10/100 NIC dedicated to iLO Management
	Storage Controller	Smart Array 6i Controller (integrated on system board)
	Hard Drives	None ship standard
	Internal Storage	Up to 600-GB maximum (with optional hard drives)
	Optical Drive	None
	Form Factor	Plugs vertically into HP BladeSystem p-Class Server Blade Enclosure
ProLiant BL25p 2.0GHz-1MB, DC 2GB (2P) 392441-B21	Processor(s)	(2) AMD Opteron Model 270 dual-core 2.0 GHz standard (up to 2 supported)
	Cache Memory	1-MB Level 2 cache per core
	Memory	2048-MB (Standard) to 16-GB (Maximum) of 2-way interleaved capable PC3200 DDR SDRAM running at 400MHz (4x512 MB)
	Network Adapter	Four Gigabit NICs (embedded) with WOL and PXE One additional 10/100 NIC dedicated to iLO Management
	Storage Controller	Smart Array 6i Controller (integrated on system board)
	Hard Drives	None ship standard
	Internal Storage	Up to 600-GB maximum (with optional hard drives)
	Optical Drive	None
	Form Factor	Plugs vertically into HP BladeSystem p-Class Server Blade Enclosure
ProLiant BL25p 2.2GHz-1MB, DC 2GB (2P) 392439-B21	Processor(s)	(2) AMD Opteron Model 275 dual-core 2.2 GHz standard (up to 2 supported)
	Cache Memory	1-MB Level 2 cache per core
	Memory	2048-MB (Standard) to 16-GB (Maximum) of 2-way interleaved capable PC3200 DDR SDRAM running at 400MHz (4x512 MB)
	Network Adapter	Four Gigabit NICs (embedded) with WOL and PXE One additional 10/100 NIC dedicated to iLO Management
	Storage Controller	Smart Array 6i Controller (integrated on system board)
	Hard Drives	None ship standard
	Internal Storage	Up to 600-GB maximum (with optional hard drives)
	Optical Drive	None
	Form Factor	Plugs vertically into HP BladeSystem p-Class Server Blade Enclosure

Models

ProLiant BL25p 2.4GHz-1MB, 1GB (1P) 374797-B21	Processor(s)	(1) AMD Opteron Model 250 single-core 2.4 GHz standard (up to 2 supported)
	Cache Memory	1-MB Level 2 cache per core
	Memory	1024-MB (Standard) to 16-GB (Maximum) of 2-way interleaved capable PC3200 DDR SDRAM running at 400MHz (2x512MB)
	Network Adapter	Four Gigabit NICs (embedded) with WOL and PXE One additional 10/100 NIC dedicated to iLO Management
	Storage Controller	Smart Array 6i Controller (integrated on system board)
	Hard Drives	None ship standard
	Internal Storage	Up to 600-GB maximum (with optional hard drives)
	Optical Drive	None
	Form Factor	Plugs vertically into HP BladeSystem p-Class Server Blade Enclosure
ProLiant BL25p 2.6GHz-1MB, 1GB (1P) 374798-B21	Processor(s)	(1) AMD Opteron Model 252 single-core 2.6 GHz standard (up to 2 supported)
	Cache Memory	1-MB Level 2 cache per core
	Memory	1024-MB (Standard) to 16-GB (Maximum) of 2-way interleaved capable PC3200 DDR SDRAM running at 400MHz (2x512MB)
	Network Adapter	Four Gigabit NICs (embedded) with WOL and PXE One additional 10/100 NIC dedicated to iLO Management
	Storage Controller	Smart Array 6i Controller (integrated on system board)
	Hard Drives	None ship standard
	Internal Storage	Up to 600-GB maximum (with optional hard drives)
	Optical Drive	None
	Form Factor	Plugs vertically into HP BladeSystem p-Class Server Blade Enclosure
ProLiant BL25p 2.6Ghz-1MB, 2GB (2P) 374799-B21	Processor(s)	(2) AMD Opteron Model 252 single-core 2.6 GHz standard (up to 2 supported)
	Cache Memory	1-MB Level 2 cache per core
	Memory	2048-MB (Standard) to 16-GB (Maximum) of 2-way interleaved capable PC3200 DDR SDRAM running at 400MHz (4x512MB)
	Network Adapter	Four Gigabit NICs (embedded) with WOL and PXE One additional 10/100 NIC dedicated to iLO Management
	Storage Controller	Smart Array 6i Controller (integrated on system board)
	Hard Drives	None ship standard
	Internal Storage	Up to 600-GB maximum (with optional hard drives)
	Optical Drive	None
	Form Factor	Plugs vertically into HP BladeSystem p-Class Server Blade Enclosure

NOTE: HP does not allow factory integration of options into standard models listed above. Configure-to-order servers must start with a CTO Chassis.

NOTE: This product offering does not support HP Factory Express Server Configuration Level 1.

Step 1: Base Server Blade Configuration

Models	HP ProLiant BL25p CTO Blade (North America)	382731-405
	HP ProLiant BL25p CTO Blade (ROW)	382731-B21
	Four Gigabit NICs (embedded) with WOL and PXE NOTE: Two can be upgraded to multifunction network adapters) Four Gigabit NICs (embedded) with WOL and PXE	
	Configurable Model ships with:	
	One additional 10/100 NIC dedicated to iLO Management Four Gigabit NICs (embedded) with WOL and PXE NOTE: Two can be upgraded to multifunction network adapters)	
	One additional 10/100 NIC dedicated to iLO Management	

Step 2: Choose Required Options (one of the following from each list unless otherwise noted):

Processors	HP BL25p 0265 1.8GHz DC FIO Base	392444-L21
	HP BL25p 0270 2.0GHz DC FIO Base	392442-L21
	HP BL25p 0275 2.2GHz DC FIO Base	392440-L21
	HP BL25p O252 2.6GHz SC FIO Base	381588-L21
	HP BL25p O250 2.4GHz SC FIO Base	381587-L21
	For dual processor configurations choose one of the above FIO choices, plus one of the matching option kits below:	
	HP BL25p Opteron 2.2GHz-1M DC Processor Option Kit	392440-B21
	HP BL25p Opteron 2.0GHz-1M DC Processor Option Kit	392442-B21
	HP BL25p Opteron 1.8GHz-1M DC Processor Option Kit	392444-B21
	HP BL25p Opteron 2.6GHz-1M SC Processor Option Kit	381588-B21
	HP BL25p Opteron 2.4GHz-1M SC Processor Option Kit	381587-B21
Memory	NOTE: Two-way memory interleaving is enabled when an identical pair of DIMMs is installed.	
	1GB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 512 MB) NOTE: Must install in pairs	376638-B21
	2GB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 1 GB)	376639-B21
	4GB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 2 GB) NOTE: Must install in pairs	379300-B21
Communications	HP ProLiant BL25/35/45p NIC Mezz FIO Base	382850-B21

Step 3: Choose Additional Factory Integratable Options

Fibre Channel Options	FC Adapter Card BL25p/45p	381881-B21

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, including server blade enclosure with enhanced backplanes, interconnect options and power subsystem options, please refer to the "Options" section below.

ProLiant Essentials Value Pack Software	ProLiant Essentials Vulnerability and Patch Management Pack, 1 Server + 10Desktop Bundle License	389941-B21
	ProLiant Essentials Vulnerability and Patch Management Pack, Single-Server License	371645-B21
	ProLiant Essentials Vulnerability and Patch Management Pack, 10-Server License	372029-B21
	ProLiant Essentials Vulnerability and Patch Management Pack, Flexible-Quantity License	371646-B21
	ProLiant Essentials Vulnerability and Patch Management Pack, Tracking License for New Servers	371647-B21
	ProLiant Essentials Vulnerability and Patch Management Pack, Tracking License for Installed servers	378372-B21
	ProLiant Essentials Server Migration Pack, 25-Server License	391674-B21
	ProLiant Essentials Server Migration Pack, 50-Server License	391675-B21
	ProLiant Essentials Server Migration Pack, 100-Server License	391676-B21
	ProLiant Essentials Server Migration Pack, 10-Server License NOTE: This license allows 10 servers to be migrated from a physical server to 10 virtual machines. Or this license can be used to migrate 10 virtual machines from one virtualization layer i.e. VMware GSX to a different virtualization layer such as VMware ESX or Microsoft Virtual Server 2005.	390739-B21
	ProLiant Essentials Server Migration Pack, Single-Server License	375345-B21
	ProLiant Essentials Server Migration Pack, Flexible-Quantity License	375346-B21
	ProLiant Essentials Server Migration Pack, Tracking license	375347-B21
	ProLiant Essentials Virtual Machine Management Pack, SINGLE LIC IP CCAO-WGR	372214-B21
	ProLiant Essentials Virtual Machine Management Pack, FLEX LIC IP CCAO-WGR	372215-B21
	ProLiant Essentials Virtual Machine Management Pack, TRACKING LIC IP CCAO-WGR	372216-B21
	ProLiant Essentials Intelligent Networking Pack, Single Server License NOTE: For use with a single server. Contains one license with a unique license activation key and documentation.	372906-B21
	ProLiant Essentials Intelligent Networking Pack, Flexible License NOTE: For use with multiple servers. This part number can be used to purchase multiple licenses with a single activation key. The quantity ordered for this part number will be the quantity of licenses included in the kit in the form of a corresponding activation key. Use the same key to activate all licenses in the actual quantity ordered. For a given order, one kit will be delivered with the activation key, and documentation.	372950-B21
	ProLiant Essentials Intelligent Networking Pack, Tracking License NOTE: For use with signed and implemented Activation Key Agreements only. Purchase of this part number entitles the customer to deploy additional licenses of the product under the terms of the existing Activation Key Agreement. NOTE: Nothing is delivered in conjunction with the purchase of this part number. Visit http://h18004.www1.hp.com/products/servers/proliantessentials/license/akalic.html for more information on Activation Key Agreements.	372951-B21
	ProLiant Essentials Performance Management Pack, Single-Server License NOTE: For use with a single server. Contains one license with a unique license activation key and documentation.	306696-B21

Options

ProLiant Essentials Performance Management Pack, 10-Server License NOTE: For use with up to 10 servers. Contains 10 licenses with one unique license activation key and documentation.	374055-B21
ProLiant Essentials Performance Management Pack, Flexible-Quantity License NOTE: For use with multiple servers. This part number can be used to purchase multiple licenses with a single activation key. The quantity ordered of this part number will be the quantity of licenses included in the kit in the form of a corresponding activation key. Use the same key to activate all licenses in the actual quantity ordered. For a given order, one kit will be delivered with activation key, and documentation.	306697-B21
ProLiant Essentials Performance Management Pack, Tracking license NOTE: For use with signed and implemented Activation Key Agreements only. Purchase of this part number entitles the customer to deploy additional licenses of the product under the terms of the existing Activation Key Agreement. NOTE: Nothing is delivered in conjunction with the purchase of this part number. Visit http://h18004.www1.hp.com/products/servers/proliantessentials/license/akalic.html for more information on Activation Key Agreements.	306698-B21
Rapid Deployment Pack, 10 User, V1.x NOTE: This license allows 10 servers to be managed and deployed via the Deployment Server. NOTE: Rapid Deployment pack is now available in Linux only environments.	269817-B21
Rapid Deployment Pack, 10 User, V1.x (Japan) NOTE: This license allows 10 servers to be managed and deployed via the Deployment Server. NOTE: Rapid Deployment pack is now available in Linux only environments.	269817-291
Rapid Deployment Pack, 1 User, V1.x NOTE: This license allows 1 server to be managed and deployed via the Deployment Server. NOTE: Rapid Deployment pack is now available in Linux only environments.	267196-B21
Rapid Deployment Pack, 1 User, V1.x (Japan) NOTE: This license allows 1 server to be managed and deployed via the Deployment Server. NOTE: Rapid Deployment pack is now available in Linux only environments.	267196-291
Flexible Quantity License Kit	302127-B21
License-Only - for use with a Master License Agreement	302128-B21
ProLiant Essentials Workload Management Pack (Featuring Resource Partitioning Manager version 2.0) NOTE: For more information regarding ProLiant Essentials Software, please see the following URL: http://hp.com/servers/proliantessentials. NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to URL http://hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information.	303284-B21

Options

Processor	HP BL25p Opteron 2.2GHz-1M DC Processor Option Kit	392440-B21
	HP BL25p Opteron 2.0GHz-1M DC Processor Option Kit	392442-B21
	HP BL25p Opteron 1.8GHz-1M DC Processor Option Kit	392444-B21
	HP BL25p Opteron 2.6GHz-1M SC Processor Option Kit	381588-B21
	HP BL25p Opteron 2.4GHz-1M SC Processor Option Kit	381587-B21
Memory (SDRAM DIMMs)	4GB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 2 GB)	379300-B21
	2GB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 1 GB)	376639-B21
	1GB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 512 MB)	376638-B21
Hard Drives	*Ultra320 SCSI – Universal Hot Plug*	
	300-GB 10,000 rpm U320 Universal Hard Drive (1")	350964-B22
	146.8-GB 10,000 rpm U320 Universal Hard Drive (1")	286716-B22
	72.8-GB 10,000 rpm U320 Universal Hard Drive (1")	286714-B22
	72.8-GB 15,000 rpm U320 Universal Hard Drive (1")	286778-B22
	146.8-GB 15,000 rpm U320 Universal Hard Drive (1")	347708-B22
	36.4-GB 15,000 rpm U320 Universal Hard Drive (1")	286776-B22
Storage Controllers	128MB Battery Backed Write Cache Enabler Option Kit	346914-B21
	NOTE: Please see the following Controller QuickSpecs for Technical Specifications such as PCI Bus, PCI Peak Data Transfer Rate, SCSI Protocols supported, SCSI Peak Data Transfer Rate, Channels, SCSI Ports, Drives supported, Cache, RAID support, and additional information: http://h18000.www1.hp.com/products/quickspecs/12030_div/12030_div.HTML (Smart Array 6i)	
ProLiant BL25/45p Fibre Channel Adapter	Dual port Fibre Channel Adapter (2-Gb) for HP ProLiant BL25p server blade (shared with the HP ProLiant BL45p server blade)	381881-B21
	NOTE: When using this card, the Patch Panel 2, CGESM, or GbE2 Interconnect Switch (with Storage Connectivity Kit) must be used to provide the Fibre Channel pass through.	
	NOTE: The BL30p/35p and BL20p dual-port Fibre Channel adapters are not compatible with the HP ProLiant BL25p server blade.	

Options

HP BladeSystem p-Class Server Blade Enclosures	HP BladeSystem p-Class Server Blade Enclosure with enhanced backplane components and the HP BladeSystem Management Suite NOTE: Includes a HP BladeSystem p-Class Server Blade Enclosure with enhanced backplane components, a single copy of Systems Insight Manager (SIM) and 8 licenses for each of the following products: Rapid Deployment Pack (RDP), Performance Management Pack (PMP) and the Vulnerability and Patch Management Pack (VPM). NOTE: The HP ProLiant BL25p server blade does not currently support PMP. Future support is planned.	380625-B22
	HP BladeSystem p-Class Server Blade Enclosure with enhanced backplane components (ProLiant Essentials Rapid Deployment Pack Trial)	243564-B22
	HP BladeSystem p-Class Server Blade Enclosure with enhanced backplane components (8 ProLiant Essentials Rapid Deployment Licenses) NOTE: HP BladeSystem p-Class Enhanced Server Blade Enclosures with enhanced backplane components may be required depending on which HP ProLiant BL25p server blade model is selected. For additional information regarding Blade Enclosure Compatibility, please visit the following URL: http://www.hp.com/go/bladesystem/enclosure/compatibility	281404-B22
	HP BladeSystem p-Class Server Blade Enclosure Upgrade Kit (option) NOTE: Server Blade Enclosure Upgrade Kit (354100-B21) contains enhanced backplane components and enables a field upgrade of a blade enclosure to support BL p-class blades and provide a single, physical iLO port for the enclosure.	354100-B21
HP BladeSystem p-Class Interconnects	ProLiant BL p-Class RJ-45 Patch Panel 2 with Fibre pass-through (pair) (required for FC connectivity) NOTE: Only one interconnect kit required per server blade enclosure.	306465-B21
	ProLiant BL p-Class RJ-45 Patch Panel (pair) NOTE: Only one interconnect kit required per server blade enclosure.	230766-B21
	ProLiant BL p-Class C-GbE2 Interconnect Kit (with pair of GbE2 Interconnect Switches and two QuadT2 Interconnect Modules) NOTE: Only one interconnect kit required per server blade enclosure.	283192-B21
	ProLiant BL p-Class F-GbE2 Interconnect Kit (with pair of GbE2 Interconnect Switches and two QuadSX Interconnect Modules) NOTE: Only one interconnect kit required per server blade enclosure.	283193-B21
	Cisco Gigabit Ethernet Switch Module for HP BladeSystem p-Class Interconnect Kit Base Unit only NOTE: Two CGESM interconnect kits required per server blade enclosure.	378926-B21
	Cisco Gigabit Ethernet Switch Module for HP BladeSystem p-Class Interconnect Kit Base Unit (populated with two RJ-45 10/100/1000 T/TX/T Small Form Factor Pluggable (SFP) Modules NOTE: Two CGESM interconnect kits required per server blade enclosure.	378927-B21
	Cisco RJ-45 10/100/1000 T/TX/T SFP Module	378928-B21
	Cisco Fiber SX SFP Module	378929-B21
	ProLiant BL p-Class Storage Connectivity Kit (with pair of OctalFC Interconnect Modules and two Fibre Channel signal conditioning cards)	321745-B21

	NOTE: Required for BL20P G3 Fibre Channel signal pass through when using the CGESM or GbE2 Interconnect Switch. NOTE: Only one Storage Connectivity Kit required per each GbE2 Interconnect Kit. NOTE: Only one Storage Connectivity Kit required for (2) CGESM Interconnect Kit.	
	ProLiant BL p-Class C-GbE Interconnect Kit (with pair of GbE Interconnect Switches and two QuadT Interconnect Modules)	249655-B21
	NOTE: Only one interconnect kit required per server blade enclosure. NOTE: The GbE Interconnect Switch supports server NIC speeds to 100 Mbps. It is recommended that a patch panel or GbE2 Interconnect Switch option be used if server NIC speeds to 1000 Mbps are required. NOTE: To meet applicable radio frequency (RF) emission limits, the sidewall panels on the ends of any individual rack or a series of coupled racks and the front and rear doors must be installed in any racks containing more than one ProLiant BL p-Class GbE Interconnect Kit.	
	ProLiant BL p-Class F-GbE Interconnect Kit (with pair of GbE Interconnect Switches and two DualTSX Interconnect Modules)	279720-B21
	NOTE: Only one interconnect kit required per server blade enclosure. NOTE: The GbE Interconnect Switch supports server NIC speeds to 100 Mbps. It is recommended that a patch panel option be used if server NIC speeds to 1000 Mbps are required. NOTE: To meet applicable radio frequency (RF) emission limits, the sidewall panels on the ends of any individual rack or a series of coupled racks and the front and rear doors must be installed in any racks containing more than one ProLiant BL p-Class GbE Interconnect Kit.	
HP BladeSystem p-Class Power Options	NOTE: Use p-Class sizing tool to help determine power configuration: http://h30099.www3.hp.com/configurator/powercalcs.asp	
	Single Phase 3U Power Enclosure with 4 power supplies (NA/JPN) (Single Phase 3U Power Enclosure holds a maximum of 4 power supplies; no need to order additional power supplies with this option kit)	239162-001
	Single Phase 3U Power Enclosure with 4 power supplies (Int'l) (Single Phase 3UPower Enclosure holds a maximum of 4 power supplies; no need to order additional power supplies with this option kit)	239162-421
	3 Phase 3U Power Enclosure with 6 power supplies (NA/JPN) (3 Phase 3U Power Enclosure holds a maximum of 6 power supplies; no need to order additional power supplies with this option kit)	230769-001
	3 Phase 3U Power Enclosure with 6 power supplies (Int'l) (3 Phase 3U Power Enclosure holds a maximum of 6 power supplies; no need to order additional power supplies with this option kit)	230769-421
	Single 3U Phase Power Enclosure (empty) (NA/JPN) (Holds up to 4 power supplies; power supplies are not included in this kit)	231710-001
	Single 3U Phase Power Enclosure (empty) (Int'l) (Holds up to 4 power supplies; power supplies are not included in this kit)	231710-421
	3 Phase 3U Power Enclosure (empty) (NA/JPN) (Holds up to 6 power supplies; power supplies are not included in this kit)	231709-001
	3 Phase 3U Power Enclosure (empty) (Int'l) (Holds up to 6 power supplies; power supplies are not included in this kit)	231709-421
	Single 3U Power Supply	239161-B21
	1U Power Enclosure with six power supplies	378284-B21

Options

	1U Power Enclosure with two power supplies	380314-B21
	Single 1U Power Supply	380312-B21
	Facility DC Power Connection	240563-B21
Power Distribution (only required with 3U power enclosures)	HP BladeSystem p-Class Scalable Bus Bar	240560-B21
	HP BladeSystem p-Class Mini Bus Bar	240559-B21
	HP BladeSystem p-Class Bus Power Box	240562-B21
	Dual Power Input Kit for Mini Bus Bar	364565-B21
	HP Modular Distribution Unit 40 Amp (NA/JPN)	252663-D75
	HP Modular Distribution Unit 40 Amp (Int'l)	252663-B34
	HP Modular Distribution Unit 32 Amp (Int'l)	252663-B33
	HP Modular Distribution Unit 24 Amp (NA/JPN) NOTE: The Modular Distribution Unit Kits excludes the extension bars as they are not required with the HP BladeSystem p-class 1U power enclosure.	252663-D74
	HP BladeSystem Power Extension Kit NOTE: This kit is specifically for HP BladeSystem p-Class customers who want to upgrade their standard server blade enclosures to enhanced server blade enclosures and would like to install an additional, redundant 3U power enclosure above the server blade enclosures rather than below them. The option kit consists of two extension cable assemblies - one for each side (A and B).	381686-B21
SAN Switches	Brocade 4GB SAN Switch, Base	A7533A
	Brocade 4GB SAN Switch, full fabric	A7534A
	Brocade 4GB SAN Switch, power pack	A7535A
	McDATA 4Gb SAN Switch	A8001A
Other Options	HP BladeSystem p-Class Diagnostic Station NOTE: The Diagnostic Station allows access to the ProLiant BL20p server blade and the BL p-Class interconnect switch outside of the server enclosure. The option provides power and a data interface so that "offline" upgrade and diagnostic functions may be performed.	230743-B21
	HP BladeSystem p-Class Power Enclosure Shipping Bracket Option Kit NOTE: Used to secure one power enclosure in a rack when moving	365044-B21
Tape Libraries	HP StorageWorks MSL6000 Tape Library	
	Ultrium 960 technology	
	MSL6030, 1 drive, 30 slots, Ultrium 960	AD606A
	MSL6030, 2 drive, 30 slots, Ultrium 960	AD607A
	MSL6030, 1 drive, 30 slots, Ultrium 960, with embedded FC router	AD608A
	MSL6030, 2 drive, 30 slots, Ultrium 960, with embedded FC router	AD609A
	MSL6060, 2 drive, 60 slots, Ultrium 960	AD610A
	MSL6060, 2 drive, 60 slots, Ultrium 960, with embedded FC router	AD611A
	SDLT 600 technology	
	MSL6026, 1 drive, 26 slots, SDLT 600	AD582A

MSL6026, 2 drive, 26 slots, SDLT 600	AD583A
MSL6026, 1 drive, 26 slots, SDLT 600, with embedded FC router	AD584A
MSL6026, 2 drive, 26 slots, SDLT 600, with embedded FC router	AD585A
MSL6052, 2 drive, 52 slots, SDLT 600	AD587A
MSL6052, 2 drive, 52 slots, SDLT 600, with embedded FC router	AD588A
Ultrium 460 technology	
MSL6030, 1 drive, 30 slots, Ultrium 460	AD598A
MSL6030, 2 drive, 30 slots, Ultrium 460	AD599A
MSL6030, 1 drive, 30 slots, Ultrium 460, with embedded FC router	AD600A
MSL6030, 2 drive, 30 slots, Ultrium 460, with embedded FC router	AD601A
MSL6060, 2 drive, 60 slot Ultrium 460, with embedded FC router	AD604A
NOTE: Please reference the MSL6000 Tape Library QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs	
HP StorageWorks MSL5026S2 Tape Library	
MSL5026S2, 1 drive, 26 slots, SDLT 320, RM	293472-B22
MSL5026S2, 2 drive, 26 slots, SDLT 320, RM	293472-B23
MSL5026S2, 1 drive, 26 slots, SDLT 320, RM with embedded FC router	293472-B24
MSL5026S2, 2 drive, 26 slots, SDLT 320, RM with embedded FC router	293472-B25
NOTE: Please reference the MSL5026S2 Tape Library QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs	
HP StorageWorks MSL5052S2 Tape Library	
MSL5052S2, 2 drive, 52 slots, SDLT 320, RM	293474-B21
MSL5052S2, 2 drive, 52 slots, SDLT 320, RM with embedded FC router	293474-B24
NOTE: Please reference the MSL5052S2 Tape Library QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http:/www.hp.com/go/ebs	
HP StorageWorks ESL E-Series Tape Libraries	
ESL Extended 712e Tape Library, 0 drive, 712 LTO slots	AA934B
ESL Extended 630e Tape Library, 0 drive, 630 SDLT slots	AA935B
ESL Extended 322e Tape Library, 0 drive, 322 LTO slots	AA939B
ESL Extended 286e Tape Library, 0 drive, 286 SDLT slots	AA940B
ESL E-Series Ultrium 960 drive kit	AD595A
ESL E-Series Ultrium 460 drive kit	AA937A
ESL E-Series Ultrium 460-FC drive kit	AA941A
ESL E-Series SDLT 320 drive kit	AA936A
ESL E-Series e2400-FC 2G Interface Controller	AA928A
NOTE: Please reference the ESL E-Series Tape Libraries QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs.	

Ultra Density Optical Jukeboxes	1000ux, 2 drive, 32 slot jukebox	AA965A
	1900ux, 4 drive, 64 slot jukebox	AA966A
	1900ux, 4 mixed drive, 64 slot jukebox	AA968A
	2300ux, 2 drive, 76 slot jukebox	AA967A
	3800ux, 4 drive, 128 slot jukebox	AA969A
	3800ux, 6 drive, 128 slot jukebox	AA970A
	7100ux, 4 drive, 238 slot jukebox	AA973A
	7100ux, 6 drive, 238 slot jukebox	AA971A
	7100ux, 10 drive, 238 slot jukebox	AA972A
	7100ux, 6 mixed drive, 238 slot jukebox	AA974A
	NOTE: Please reference the Ultra Density Optical Jukebox QuickSpecs at http://www.hp.com/go/optical for additional information needed to create a complete solution.	
Magneto-Optical Jukeboxes	**HP StorageWorks 9.1 GB Mid-range Optical Jukeboxes**	
	300mx, 2 drive, 32 slot jukebox	C1150M
	600mx, 4 drive, 64 slot jukebox	C1160M
	700mx, 2 drive, 76 slot jukebox	C1170M
	NOTE: Please reference the Magneto-Optical Jukebox data sheets at http://www.hp.com/go/optical for additional information needed to create a complete solution	
	HP StorageWorks 9.1 GB High-end Optical Jukeboxes	
	1200mx, 4 drive, up to 128 slots	C1104M
	1200mx, 6 drive, up to 128 slots	C1105M
	2200mx, 4 drive, up to 238 slots	C1111M
	2200mx, 6 drive, up to 238 slots	C1107M
	2200mx, 10 drive, up to 238 slots	C1110M
	NOTE: Please reference the Magneto-Optical Jukebox data sheets at http://www.hp.com/go/optical for additional information needed to create a complete solution.	

Options

HP StorageWorks Modular Smart Array 1000	HP StorageWorks Modular Smart Array 1000	201723-B22
	Modular Smart Array 1000 Controller	218231-B22
	Modular Smart Array Fibre Channel I/O Module	218960-B21
	Modular Smart Array hub 2/3	286763-B21
	HP StorageWorks Modular Smart Array 1000	201723-B22
	NOTE: Please see the StorageWorks Modular Smart Array 1000 QuickSpecs for additional options and configuration information at: http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML (North America) http://h18000.www1.hp.com/products/quickspecs/11033_div/11033_div.HTML (Worldwide)	
HP StorageWorks Modular Smart Array 1500	HP StorageWorks Modular Smart Array 1500	AA986A
	NOTE: Please see the StorageWorks Modular Smart Array 1500 QuickSpecs for additional options and configuration information at: http://h18000.www1.hp.com/products/quickspecs/11945_na/11945_na.HTML (North America) http://h18000.www1.hp.com/products/quickspecs/11945_div/11945_div.HTML (Worldwide)	
Cluster Options	HP Serviceguard for Linux License A.11.15 for SUSE SLES 8 / UnitedLinux 1.0 and Red Hat EL 3 (single license version)	307754-B26
	HP Serviceguard for Linux ProLiant Cluster A.11.15 for SUSE SLES 8 / UnitedLinux 1.0 and Red Hat EL 3 (2 node license cluster kit).	305199-B26
	NOTE: For additional information regarding the HP Serviceguard for Linux License, please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html (North America) http://h18000.www1.hp.com/products/quickspecs/11518_div/11518_div.html (Worldwide)	
USB Options	USB 1.44-MB External Diskette Drive (Carbonite)	DC141B
	USB 2-Button Optical Mouse (Carbonite)	DC172B
	USB Optical Scroll Mouse (Carbonite)	DD441B
	256MB HP Drive Key II (USB 2.0)	PH657A

Options

HP Rack 5000 Series (Graphite Metallic)	HP 5642 Rack - Unassembled	358254-B21
Rack Options for Rack 5000 Series	Stabilizer Kit for 5642 Rack (Graphite Carbon) NOTE: The stabilizing kit is used to prevent rack from tipping over.	374493-B21
	Baying Kit for 5642 Rack (Graphite Carbon) NOTE: The baying kit is used to join two or more HP 5642 racks.	374499-B21
Rack 10000 Series (Graphite Metallic)	Rack, HP Infrastructure 42U (HV)	379005-001
	Rack, HP Infrastructure 42U (LV)	379006-001
	HP Rack 10842 (42U) - Pallet	257415-B21
	HP Rack 10842 (42U) - Shock Pallet	257415-B22
	HP S10614 (14U) Rack Cabinet - Shock Pallet	292302-B22
	HP Rack 10647 (47U) Cabinet - Pallet	245160-B21
	HP Rack 10647 (47U) Cabinet - Crated	245160-B23
	HP Rack 10642 (42U) Cabinet - Pallet	245161-B21
	HP Rack 10642 (42U) Cabinet - Shock Pallet	245161-B22
	HP Rack 10642 (42U) Cabinet - Crated	245161-B23
	HP Rack 10636 (36U) Cabinet - Pallet	245162-B21
	HP Rack 10636 (36U) Cabinet - Shock Pallet	245162-B22
	HP Rack 10636 (36U) Cabinet - Crate	245162-B23
	HP Rack 10622 (22U) Cabinet - Pallet	245163-B21
	HP Rack 10622 (22U) Cabinet - Shock Pallet	245163-B22
	HP Rack 10622 (22U) Cabinet - Crated	245163-B23
	NOTE: -B21 (pallet) used to ship empty racks shipped on a truck -B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels) -B23 (crated) used for air shipments of empty racks Not all HP equipment is qualified to be shipped in the Rack 10000 series.	
	NOTE: Please see the Rack 10000 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/10995_div/10995_div.HTML (Worldwide) http://h18000.www1.hp.com/products/quickspecs/10995_na/10995_na.HTML (North America)	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html	

Options

Rack Options for HP Rack 10000 Series	HP Light kit for 10000 series rack	361589-B21
	HP Plinth kit for 10000 series rack	251960-B21
	42U Side Panel – Graphite Metallic	246099-B21
	36U Side Panel – Graphite Metallic	246102-B21
	47U Side Panel – Graphite Metallic	255486-B21
	NOTE: For additional information regarding Rack Options, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html.	
	TFT5600 Rack Keyboard Monitor	221546-xx1
	TFT7210R Rack Mounted 17" Monitor	348373-B21
	NOTE: For a complete list of Monitors please view the following URL: http://h18004.www1.hp.com/products/monitors/	
	1U Rack Keyboard & Drawer (Carbon)	257054-xx1

Country Code Key *(for 1U Rack Keyboard & Drawer (PN 257054-xx1))*

XX = 001	US	XX = 091	Norway
XX = 031	UK	XX = 101	Sweden/Finland
XX = 041	Germany	XX = 111	Switzerland
XX = 051	France	XX = 131	Portugal
XX = 061	Italy	XX = 181	Belgium
XX = 071	Spain	XX = 291	Japan
XX = 081	Denmark	XX = B31	International

NOTE: For additional information regarding Rack Options, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html.

HP KVM Switch Options	IP Console Switch Box (KVM/IP), 1 x 1 x 16	262585-B21
	IP Console Switch Box (KVM/IP) , 3 x 1 x 16	262586-B21
	Serial Interface adapter - 1 Pack with power supply	373035-B21
	Interface adapter - USB 1.0 (single pack)	336047-B21
	CAT5e Cable 3', 4 pack	263474-B21
	CAT5e Cable 6', 8 pack	263474-B22
	CAT5e Cable 12', 8 pack	263474-B23
	CAT5e Cable 20', 4 pack	263474-B24
	CAT5e Cable 40', 1 pack	263474-B25
	NOTE: For additional information regarding HP KVM Switches and options, please see the following URL: http://h18004.www1.hp.com/products/servers/proliantstorage/rack-options/list.html/#console	

Rack Options for Telco Racks	ProLiant BL p-Class Bus Bar Telco Rack Kit	245249-B21
	ProLiant BL p-Class Enclosure Telco Rack Kit	266076-B21

Options

Service and Support Offerings (HP Care Pack Services)

NOTE: The HP Care Pack services for ProLiant BL p-Class server blades, cover the server blade and the p-Class blade enclosure that the server blade is installed in as well as interconnects, power enclosure with power supplies and power distribution.

Hardware Services On-site Service	
Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years	UA203A
Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic	UA203E
4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years	UA204A
4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UA204E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years	UA205A
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UA205E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years	UA206A
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UA206E
Installation & Start-up Services	
ProLiant BL p-Class Blade Server Hardware Installation	UA219A
ProLiant BL p-Class Blade Server Hardware Installation, Electronic	UA219E
ProLiant BL p-Class Enclosure and Server Blade Hardware Installation	U4971A
ProLiant BL p-Class Enclosure and Server Blade Hardware Installation, Electronic	U4971E
Provides for the Installation and Start-up of ProLiant Essentials Rapid Deployment Pack on a Customer supplied server designated as a Deployment Server. Includes the deployment of a single server. This new server will be deployed using either one of the pre-configured scripts or an image. In addition, the service will provide for the capture and storage of the configuration of the newly deployed server and orientation on product usage. To be delivered during standard office ours, standard office days.	U5683A
Provides for the Installation and Start-up of ProLiant Essentials Rapid Deployment Pack on a Customer supplied server designated as a Deployment Server. Includes the deployment of a single server. This new server will be deployed using either one of the pre-configured scripts or an image. In addition, the service will provide for the capture and storage of the configuration of the newly deployed server and orientation on product usage. To be delivered during standard office ours, standard office days. Electronic.	U5683E
Provides for the Installation and Start-up of Rapid Deployment Pack Implementation of Rapid Deployment Pack (Basic)	UA042A
Provides for the Installation and Start-up of Rapid Deployment Pack Implementation of Rapid Deployment Pack (Basic) (Electronic)	UA042E
Provides for the Installation and Start-up of System Insight Manager	UA041A
Provides for the Installation and Start-up of System Insight Manager (Electronic)	UA041E
Provides for the Installation and Start-up of System Insight Manager Agents	UA040A
Provides for the Installation and Start-up of System Insight Manager (Electronic)	UA040E

NOTE: For more information, customer/resellers can contact http://www.hp.com/hps/carepack/services/

Software Operating Environment Care Packs	
Microsoft Software Operating Environment Software Telephone 9x5 - 3 incident	U8169A

Microsoft Software Operating Environment Software Telephone 9x5 - 3 incident (Electronic)	U8169E
Red Hat Software Operating Environment Software Telephone 9x5 - 10 incident	U3402A
Red Hat Software Operating Environment Software Telephone 9x5 - 10 incident (Electronic)	U3402E
SUSE Software Operating Environment Software Telephone 9x5 - 3 incident	U9615A
SUSE Software Operating Environment Software Telephone 9x5 - 3 incident (Electronic)	U9615E
ProLiant Essentials Operating Environment, - 5 Day, 8x5,1 year, 3 incident	U8222A
ProLiant Essentials Operating Environment, - 5 Day, 8x5,1 year, 3 incident (Electronic)	U8222E

Memory

HP ProLiant BL25p Server Blade (2P Models)

Standard Memory

2048-MB PC3200 Registered DDR SDRAM DIMM installed (4 x 512MB SDRAM DIMM)

Standard Memory Plus Optional Memory

Up to 10240-MB of DDR SDRAM DIMM memory is available with the installation of optional DDR SDRAM DIMM memory expansion kits.

Standard Memory Replaced with Optional Memory

Up to 16384-MB of DDR SDRAM DIMM memory is available with the removal of standard memory and the installation of optional SDRAM DDR DIMM memory expansion kits.

Memory		Slot							
		1	2	3	4	5	6	7	8
Standard	2048 MB	512 MB	512 MB	Empty	Empty	512 MB	512 MB	Empty	Empty
Optional	10240 MB	2048 MB	2048 MB	512 MB	512 MB	2048 MB	2048 MB	512 MB	512 MB
Maximum	16384 MB	2048 MB	2048 MB	2048 MB	2048 MB	2048 MB	2048 MB	2048 MB	2048 MB

Following are memory options available from HP:

- 4096MB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 2 GB) 379300-B21
- 2048MB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 1 GB) 376639-B21
- 1024MB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 512 MB) 376638-B21

HP ProLiant BL25p Server Blade (1P Model)

Standard Memory

1024-MB PC3200 400MHz Registered DDR SDRAM DIMM installed

Standard Memory Plus Optional Memory

Up to 5120-MB of DDR SDRAM DIMM memory is available with the installation of optional DDR SDRAM DIMM memory expansion kits.

Standard Memory Replaced with Optional Memory

Up to 8192-MB of DDR SDRAM DIMM memory is available with the removal of standard memory and the installation of optional DDR SDRAM DIMM memory expansion kits.

Memory		Slot							
		1	2	3	4	5	6	7	8
Standard	1024 MB	512 MB	512 MB	Empty	Empty	Empty	Empty	Empty	Empty
Optional	5120 MB	2048 MB	2048 MB	512 MB	512 MB	Empty	Empty	Empty	Empty
Maximum	8192 MB	2048 MB	2048 MB	2048 MB	2048 MB	Empty	Empty	Empty	Empty

Following are memory options available from HP:

- 4096MB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 2 GB) 379300-B21
- 2048MB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 1 GB) 376639-B21
- 1024MB of Advanced ECC PC3200 DDR SDRAM DIMM Memory Kit (2 x 512 MB) 376638-B21

HP BladeSystem p-Class Server Blade Enclosure	Dimensions	Height	10.5 in (26.67 cm)	
		Width	17.60 in (44.70 cm)	
		Depth	28.86 in (73.30 cm)	
	Input Specifications	Rated input voltage	-43 VDC to -53 VDC	Nominal -48 VDC
		Rated input current	62.5 A at -48 VDC	
		Rated input Power	3000 W	
	Individual Server Blade Bay Ratings	Rated input voltage	-43 VDC to -53 VDC	Nominal -48 VDC
		Rated input current	6.25 A at -48 VDC	
		Rated input Power	300 W	
	Temperature Range	Operating	50° to 95° F (10° to 35° C)	
		Non-Operating	-22° to 140° F (-30° to 60° C)	
	Relative Humidity (non-condensing)	Operating	20% to 80%	
		Non-Operating	5% to 95%	
	Wet Bulb Temperature	Operating	82.4° F (28° C)	
		Non-Operating	101.7° F (38.7° C)	

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

HP BladeSystem p-Class Server Blade Enclosure with enhanced backplane components	Dimensions	Height	10.5 in (26.67 cm)	
		Width	17.60 in (44.70 cm)	
		Depth	28.86 in (73.30 cm)	
	Input Specifications	Rated input voltage	-43 VDC to -53 VDC	Nominal -48 VDC
		Rated input current	125 A at -48 VDC	
		Rated input Power	6000 W	
	Individual Server Blade Bay Ratings	Rated input voltage	-43 VDC to -53 VDC	Nominal -48 VDC
		Rated input current	14.6 A at -48 VDC	
		Rated input Power	700 W	
	Temperature Range	Operating	50° to 95° F (10° to 35° C)	
		Non-Operating	-22° to 140° F (-30° to 60° C)	
	Relative Humidity (non-condensing)	Operating	20% to 80%	
		Non-Operating	5% to 95%	
	Wet Bulb Temperature	Operating	82.4° F (28° C)	
		Non-Operating	101.7° F (38.7° C)	

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Technical Specifications

Operating and Performance Specifications for RJ-45 Patch Panel 2 with Fiber Channel pass through	Dimensions	Height	10.405 in (26.43 cm)
		Width	1.535 in (3.899 cm)
		Depth	27.697 in (70.35 cm)
	Capability	IEEE 802.2, 802.3, 802.3u	
	Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (full-duplex)	1000 Mbps
	Fiber Channel SAN	Velio VC1070 re-timer	Auto-rate negotiate between 2G and 1G
	Connector	Network	RJ-45 in the back.
		Fiber Channel SAN	Pluggable SFP optical slot in the front.
	Cable Support	10 Base-TX	Categories 3, 4, or 5 UTP (2 or 4 pair); up to 328 ft (100 m)
		100 Base-TX	Category 5 UTP (2 pair); up to 328 ft/100 m
		1000 Base-TX	Category 5E (4 pair); up to 328 ft (100 m)
		Fiber Channel	SFP optical cable
	EMI	FCC Class A	
		ICES-003 Class A	
		AS/NZS 3548 Class A	
		VCCI Class A	

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for RJ-45 Patch Panel	Dimensions	Height	10.405 in (26.43 cm)
		Width	1.535 in (3.899 cm)
		Depth	27.697 in (70.35 cm)
	Capability	IEEE 802.2, 802.3, 802.3u	
	Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (full-duplex)	1000 Mbps
	Connector	Network	RJ-45 in the back
	Cable Support	10 Base-TX	Categories 3, 4, or 5 UTP (2 or 4 pair); up to 328 ft (100 m)
		100 Base-TX	Category 5 UTP (2 pair); up to 328 ft (100 m)
		1000 Base-TX	Category 5E (4 pair); up to 328 ft (100 m)
	Power Requirements	200 mA at + 5V DC; 500 mA at -48V	
	Temperature Range	Operating	50° to 95° F (10° to 35° C)
		Non-operating	-22° to 140° F (-30° to 60° C)

	Relative Humidity (non-condensing)	Operating	20% to 80%
		Non-operating	5% to 95%
	Wet Bulb Temperature	Operating	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for ProLiant BL p-Class GbE Interconnect Switch	Dimensions	Height	10.405 in (26.43 cm)
		Width	1.535 in (3.899 cm)
		Depth	27.697 in (70.35 cm)
	Weight	11.5 lb/5.2 kg per interconnect switch	
	Performance	9.6 Gbps external port bandwidth per server blade enclosure (full duplex)	
		Forwarding rate 0.15 million pps per 10/100 port, 1.5 million pps per gigabit port, (64-byte packets)	
		Non-blocking, full-wire speed for all connections	
		Auto-MDI/MDIX, auto-negotiation and auto-sensing with full-duplex support	
	Forwarding Mode	Store and forward	
	MAC Addresses	8,191 per interconnect switch; MAC address based filtering and MAC address packet priority configuring	
	Forwarding Table Age Time	Maximum age: 1 to 1,000,000 seconds; default: 300 seconds	
	Memory	32MB Main, 6MB flash and 16MB packet buffer per interconnect switch	
	Compliance	IEEE 802.3, 802.3u, 802.3ab, 802.3x, 802.3z (F-GbE only), 802.1D, 802.1p, 802.3ac, 802.3ad (Static), and 802.1Q	
		SNMP v1 (RFC 1157) and RMON v1 (RFC 1757) groups 1, 2, 3, and 9	
		MIB-II (RFC 1213), Bridge MIB (RFC 1493), Interface Group MIB (RFC 2863), Ethernet MIB (RFC 1643), 802.1Q Extended Bridge MIB (RFC 2674), Entity MIB (RFC 2037), SNMP Trap Convention (RFC 1215), Bridge Trap (RFC 1493), Remote Monitoring Traps (RFC 1757), and HP Enterprise Switch MIBs and Environmental Traps	
		IGMP v1 (RFC 1112), IGMP v2 (RFC 2236), SNTP (RFC 1361), Telnet (RFC 854), TFTP client (RFC 783), BootP client, (RFC 2132), DHCP client, (RFC 2131) and ZModem,	
	Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (half and full-duplex)	2000 Mbps
		1000 Base-SX (full-duplex)	2000 Mbps
	Connector	12 RJ-45, 2 DB-9 (C-GbE Interconnect Kit) 4 LC fiber, 8 RJ-45, 2 DB-9 (F-GbE Interconnect Kit)	

Cable Support	FCC Class A		
	ICES-003 Class A		
	AS/NZS 3548 Class A		
	VCCI Class A		
Safety	UL/CUL Listed Accessory		
	CE		
Power Requirements	-48VDC: 1050 mA, 50 W maximum (per interconnect switch)		
Temperature Range	Operating	50° to 95° F (10° to 35° C)	
	Non-operating	-22° to 140° F (-30° to 60° C)	
Relative Humidity (non-condensing)	Operating	20% to 80%	
	Non-operating	5% to 95%	
Wet Bulb Temperature	Operating	82.4° F (28° C)	
	Non-operating	101.7° F (38.7° C)	

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for GbE2 Interconnect Switch	Dimensions	Height	10.405 in (26.43 cm)
		Width	1.535 in (3.899 cm)
		Depth	27.697 in (70.35 cm)
	Weight	12.0 lb/5.4 kg per interconnect switch	
	Performance	24 Gbps External port bandwidth per server blade enclosure (full duplex)	
		Forwarding rate 1.5 million pps per gigabit port (64-byte packets)	
		Auto-MDI/MDIX, auto-negotiation and auto-sensing with full-duplex support	
	Forwarding Mode	Store and forward	
	MAC Addresses	2,048 per interconnect switch	
	Forwarding Table Age Time	Maximum age: 1 to 65535 seconds; default: 300 seconds	
	Memory	128MB Main, 32MB flash and 2MB packet buffer per interconnect switch	
	Compliance	IEEE 802.3, 802.3u, 802.3ab, 802.3x, 802.3z (F-GbE2 only), 802.1D, 802.3ac, 802.3ad (Static), and 802.1Q	
		SNMP v1 (RFC 1157), MIB-II (RFC 1213), Bridge MIB (RFC 1493), Interface Group MIB (RFC 2863), Ethernet MIB (RFC 1643), 802.1Q Extended Bridge MIB , Entity MIB (RFC 2037), RADIUS Authentication MIB, 802.3-2002 MIB, SNMP Trap Convention (RFC 1215), Bridge Trap (RFC 1493), Remote Monitoring Traps (RFC 1757) and HP Enterprise Switch MIBs and Environmental Traps	
		RADIUS (RFC 2138), Telnet (RFC 854), TFTP client (RFC 783), SSH v1.5, SCP v1.5, NTP v2 (RFC 1119), BootP client (RFC 2132), and XModem	

	Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (half and full-duplex)	2000 Mbps
		1000 Base-SX (full-duplex)	2000 Mbps
	Connector	12 RJ-45, 2 DB-9 (C-GbE2 Interconnect Kit) 8 LC fiber, 4 RJ-45, 2 DB-9 (F-GbE2 Interconnect Kit)	
	EMI	FCC Class A	
		ICES-003 Class A	
		AS/NZS 3548 Class A	
		VCCI Class A	
	Safety	UL/CUL Listed Accessory	
		CE	
	Power Requirements	48VDC: 2040 mA, 98 W maximum (per interconnect switch without Storage Connectivity Kit) 48VDC: 2355 mA, 113 W maximum (per interconnect switch with Storage Connectivity Kit)	
	Temperature Range	Operating	50° to 95° F (10° to 35° C)
		Non-operating	-22° to 140° F (-30° to 60° C)
	Relative Humidity (non-condensing)	Operating	20% to 80%
		Non-operating	5% to 95%
	Wet Bulb Temperature	Operating	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F/1° C per 1,000 ft/304.8 m. No direct sunlight. Upper operating limit is 10,000 ft/3,048 m or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft/9,144 m or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F/45° C. Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for CGESM Interconnect Switch	Dimensions	Height	10.405 in (26.43 cm)
		Width	1.6 in (4.06 cm)
		Depth	28 in (71.12 cm)
	Weight	11.5 lb/5.2 kg per interconnect switch	
	Performance	28 Gbps Maximum Forwarding Bandwidth. 38.7mpps Maximum Forwarding Rate (64 Byte Packets)	
		9018Bytes Jumbo Frames MTU	
		Non-blocking architecture. Wire Speed Performance on all ports	
		Auto-MDI/MDIX, auto-negotiation and auto-sensing with full-duplex support	
	Forwarding Mode	Store and forward	
	MAC Addresses	8000 MAC/physical address Table Size	
	Memory	128MB DRAM Memory. 16MB Flash Memory	

Compliance	IEEE 802.1s, IEEE 802.1w, IEEE 802.1x, IEEE 802.3ad, IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and, IEEE 802.1D Spanning-Tree Protocol, IEEE 802.1p CoS Prioritization, IEEE 802.1Q VLAN, IEEE 802.3 10BASE-T specification, IEEE 802.3u 100BASE-TX specification, IEEE 802.3ab 1000BASE-T specification, IEEE 802.3z 1000BASE-X specification	
	RMON I and II standards, SNMPv1, SNMPv2c, and SNMPv3	
	(RFC1493) , CISCO-CDP-MIB, CISCO-CLUSTER-MIB, CISCO-CONFIG-MAN-MIB, CISCO-ENTITY-FRU-CONTROL-MIB, CISCO-ENVMON-MIB, CISCO-FLASH-MIB, CISCO-FTP-CLIENT-MIB, CISCO-IGMP-FILTER-MIB, CISCO-IMAGE-MIB, CISCO IP-STAT-MIB, CISCO-MAC-NOTIFICATION-MIB, CISCO-MEMORY-POOL-MIB, CISCO-PAGP-MIB, CISCO-PING-MIB, CISCO-PROCESS-MIB, CISCO-RTTMON-MIB, CISCO-STP-EXTENSIONS-MIB, CISCO-SYSLOG-MIB, CISCO-TCP-MIB, CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB, CISCO-VLAN-MEMBERSHIP-MIB, CISCO-VTP-MIB, ENTITY-MIB, ETHERLIKE-MIB, IF-MIB (in and out counters for VLANs are not supported), IGMP-MIB, OLD-CISCO-CHASSIS-MIB, OLD-CISCO-FLASH-MIB, OLD-CISCO-INTERFACES-MIB, OLD-CISCO-IP-MIB, OLD-CISCO-SYS-MIB, OLD-CISCO-TCP-MIB, OLD-CISCO-TS-MIB, RFC1213-MIB (per the agent capabilities specified in the, CISCO-RFC1213-CAPABILITY.my), RFC1253-MIB, RMON-MIB, RMON2-MIB, SNMP-FRAMEWORK-MIB, SNMP-MPD-MIB, SNMP-NOTIFICATION-MIB, SNMP-TARGET-MIB, SNMPv2-MIB, TCP-MIB, UDP-MIB	
	1000BASE-T ports, 1000BASE-X (SFP), 1000BASE-SX	
Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
	10 Base-T (full-duplex)	20 Mbps
	100 Base-TX (half-duplex)	100 Mbps
	100 Base-TX (full-duplex)	200 Mbps
	1000 Base-TX (half and full-duplex)	2000 Mbps
	1000 Base-SX (full-duplex)	2000 Mbps
Connector	4 SFP, 2 RJ-45 10/100/1000 T/TX/T, 1 DB-9	
EMI	FCC Part 15 Class A	
	EN 55022: 1998 (CISPR22) EN 55024: 1998 (CISPR24) CNS 13438 Class A MIC CD MIC	
	AS/NZS 3548 Class A CE	
	VCCI Class A	
Safety	UL to UL 60950, Third Edition C-UL to CAN/CSA C22.2 No. 60950-00, Third Edition TUV/GS to EN 60950:2000 CB to IEC 60950 with all country deviations NOM to NOM-019-SCFI	
	CE Marking	
Power Requirements	-48VDC: 1050 mA, 125 W maximum (per interconnect switch)	
Temperature Range	Operating	50° to 95° F (10° to 35° C)
	Non-operating	-22° to 140° F (-30° to 60° C)

Relative Humidity (non-condensing)	Operating	20% to 80%
	Non-operating	5% to 95%
Wet Bulb Temperature	Operating	82.4° F (28° C)
	Non-operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F/1° C per 1,000 ft/304.8 m. No direct sunlight. Upper operating limit is 10,000 ft/3,048 m or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft/9,144 m or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F/45° C. Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for Power Enclosures (North America/Japan)

		Single-Phase Model	Three-Phase Model
Dimensions	Height	5.25 in (13.34 cm)	5.25 in (13.34 cm)
	Width	27.15 in (68.96 cm)	27.15 in (68.96 cm)
	Depth	17.60 in (44.7 cm)	17.60 in (44.7 cm)
Weights	No Hot-Plug Power Supplies	47.5 lb (21.55 kg)	47.5 lb (21.55 kg)
	All Hot-Plug Power Supplies	99.5 lb (45.13 kg)	125.5 lb (56.93 kg)
Input Requirements	Rated input voltage	200 VAC to 240 VAC	200 VAC to 240 VAC line to line
	Rated input frequency	50 Hz to 60 Hz	50 Hz to 60 Hz
	Rated input current per side	24A	24A per phase
	Rated input power per side	5760 W	9976 W
	Power cord	1 NEMA L6-30P per side	1 NEMA L15-30 per side
Output Voltage Specifications	Rated output voltage	-48.8 VDC to -54 VDC	-48.8 VDC to -54 VDC
	Rated output current	99A	170A
	Rated output power	4298 W	8310 W
	Nominal power	4158 W at 208 VAC	7202 W at 208 VAC
Ambient Temperature Range (See NOTE)	Operating	50° to 95° F (10° to 35° C)	50° to 95° F (10° to 35° C)
	Shipping	-22° to 140° F (-30° to 60° C)	-22° to 140° F (-30° to 60° C)
Relative humidity, non-condensing (See NOTE)	Operating	20% to 80%	20% to 80%
	Non-operating	5% to 95%	5% to 95%
Wet Bulb Temperature	Operating	82.4° F (28° C)	82.4° F (28° C)
	Non-operating	101.7° F (38.7° C)	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Technical Specifications

			Single-Phase Model	Three-Phase Model
Operating and Performance Specifications for Power Enclosures (International)	Dimensions	Height	5.25 in (13.34 cm)	5.25 in (13.34 cm)
		Width	27.15 in (68.96 cm)	27.15 in (68.96 cm)
		Depth	17.60 in (44.7 cm)	17.60 in (44.7 cm)
	Weights	No Hot-Plug Power Supplies	47.5 lb (21.55 kg)	47.5 lb (21.55 kg)
		All Hot-Plug Power Supplies	99.5 lb (45.13 kg)	125.5 lb (56.93 kg)
	Input Requirements	Rated input voltage	200 VAC to 240 VAC	6.25 A at -48 VDC 200 VAC to 240 VAC line to neutral
		Rated input frequency	50 Hz to 60 Hz	50 Hz to 60 Hz
		Rated input current per side	24A	20A per phase
		Rated input power per side	5760 W	10,552 W
		Power cord	1 IEC 309 3-pin, 32A per side	1 IEC 309 5-pin, 32A per side
	Output Voltage Specifications	Rated output voltage	-48.8 VDC to -54 VDC	-48.8 VDC to -54 VDC
		Rated output current	99A	180A
		Rated output power	4798 W	8790 W
		Nominal power	4598 W at 208 VAC	8790 W at 230 VAC L-N
	Ambient Temperature Range (See NOTE)	Operating	50° to 95° F (10° to 35° C)	50° to 95° F (10° to 35° C)
		Shipping	-22° to 140° F (-30° to 60° C)	-22° to 140° F (-30° to 60° C)
	Relative humidity, non-condensing (See NOTE)	Operating	20% to 80%	20% to 80%
		Non-operating	5% to 95%	5% to 95%
	Wet Bulb Temperature	Operating	82.4° F (28° C)	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Technical Specifications

		Power Bus Box	Mini Bus Bar	Scalable Bus Bar
Operating and Performance Specifications for Power Distribution Devices	Power Enclosures or facility DC feeds Supported (3U each)	1	1	2
	Server blade enclosures supported (6U each)	1	3	5
	Total rack height of supported enclosures	9U	21U	36U
	Dimensions			
	Height	5.1 in (12.95 cm)	19.45 in (49.40 cm)	48.57 in (123.37 cm)
	Width	3.6 in (9.14 cm) each	19.74 in (50.14 cm)	19.74 in (50.14 cm)
	Depth	3.25 in (8.26 cm)	2.2 in (5.59 cm)	2.2 in (5.59 cm)
	Weight	3.62 lb (1.64 kg)	13.2 lb (5.9 kg)	26 lb (11.79 kg)
	Rated Operating Voltage	-43.2 VDC to -54 VDC	-43.2 VDC to -54 VDC	-43.2 VDC to -54 VDC
	Max Total Power Supported	3000 W	9000 W	15000 W
	Total Max Input Current At Minimum Voltage	69.44 A at -43.2VDC	208.32 A at -43.2 VDC	347.2 A at -43.2 VDC (equivalent of 175A per feed)
	Total Max Input Current At Nominal Voltage	62.5 A at -48VDC	187.5 A at -48 VDC	312.5 A at -48 VDC (equivalent of 175A per feed)
	Max Current Per Power Feed	70A	70A	210A
	Max Local Ambient Temperature	149° F (65° C)	149° F (65° C)	149° F (65° C)

NOTE: All systems support redundant A & B feeds. Scalable bus bar supports dual A and dual B feeds.

Operating and Performance Specifications for Facility DC	Voltage	Nominal input voltage	-48 VDC
		Operating voltage range	-48VDC ± 10% or -43.2 VDC to -52.8 VDC
		Max Input voltage slew rate	0.5V/uS
		Redundant feed voltages* (A & B)	*A and B feeds must differ by no more than 5VDC during steady state operation
		Ripple/Noise	480 mV PARD**
		Overshoot	Must remain within regulation limits on all feeds during startup or shutdown
		Voltage transients	Must not exceed -60 VDC

Current	Max steady state input current	62.5A per server blade enclosure installed at -48VDC
	Max steady state current per feed/total	
	Power bus boxes	70 A/70A
	Mini bus bars	210 A/210A
	Scalable bus bars	210 A/350A or equivalent of 175A per feed*
In-rush current	Must support up to 2X the maximum operating current per server blade enclosure (125 A) for up to 1.0 mS	
Input over-current	Customer provided fusing for facility DC feeds that protects the system from catastrophic over-current within 20 uS. Fuse should sustain all in-rush and operating currents.	
Max Input Current Slew Rate	1A/uS	
Max Rated Power	3000W per server blade enclosure	
Connections and Cables	Compaq provided facility DC cable connection kit: • The facility DC connection kit supports the connection of up to four -48VDC, RETURN pairs and ground The power cable assemblies consist of 1/0AWG, color-coded, flexible cable rated at 105° C, terminated with bus mating connectors at one end and unterminated at the other end. The cable length provided enables the customer to route to a fuse panel within or adjacent to the rack.	

NOTE: *All systems support redundant A and B feeds. Scalable bus bars support dual A and dual B feeds.

** Periodic and random noise (PARD). Maximum allowable peak-to-peak ripple and noise (as measured at the load on any output channel). The ripple and noise is measured over a 20 Hz to 100 MHz frequency band. A resistive load (non-electronic) is used for this measurement. Each output is by-passed to return by a 10uF tantalum capacitor with an ESR less than 100 milli-Ohms in parallel with a 0.47 uF ceramic capacitor, at the point of load. The load cable is 12 feet of twisted wire capable of carrying the current. The printed wiring board assembly is installed in its enclosure for this measurement, or the measurement leads are properly shielded with Earth grounds applied to the insert.

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